

DENVER COMMENTS – JANUARY 29, 2014¹

Denver Attachment
1 (01-29-2014)

DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

**Solid and Hazardous Waste Commission/Hazardous Materials and
Waste Management Division**

6 CCR 1007-2

PART 1 - REGULATIONS PERTAINING TO SOLID WASTE SITES AND FACILITIES

**Deletion and Replacement of Existing Section 5.5 Regulations (Management of
Asbestos-Contaminated Soil) with New Section 5.5 Regulations (Management of
Regulated Asbestos Contaminated Soil (RACS)); the Addition of Appendix 5A
(Sample Collection Protocols and Analytical Methodologies) and the Associated
Additions and Revision to Section 1.2 Definitions**

**1) Section 1.2 is being amended by adding the following definitions in
alphabetical order to read as follows:**

1.2 Definitions

“Adjacent Receptor Zone” means an area of uncontrolled access at a distance of 150’
or less from the nearest Regulated Work Area (RWA) boundary during active RACS
disturbance. For the purpose of this definition, highways, streets, and roadways without
sidewalks, where only vehicles ~~as defined in §42-1-102, C.R.S.~~ are permitted, are
considered to be areas of controlled access and therefore not adjacent receptor zones.
For the purpose of this definition "vehicle" means a device that is capable of moving
itself, or of being moved, from place to place upon wheels, including bicycles and
electrical assisted bicycles. For the purpose of this definition, an area for which access
is not ordinarily controlled that is closed to the public during soil disturbing activities in
the adjacent RWA is considered to be an area of controlled access and therefore not an
adjacent receptor zone.

¹ The Division’s redlines appear in blue with double-underlining, single strike-out. Denver’s redlines appear in red, single underlining and single strike-out, and are explained with marginal comments. Cross-references to page/line numbers are internal to this document.

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39 **“Air Monitoring Specialist” (“AMS”)** means a person trained and certified, in
40 accordance with the requirements of Air Quality Control Commission Regulation No. 8
41 (5 CCR 1001-10, Part B), for the collection of air samples to determine airborne
42 particulate and/or asbestos concentrations.

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46 **“Ancillary Worker”** means a worker that has not completed the training under Section
47 5.5.3(C) and (D) of these Regulations.

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50 **“Area of Contamination” (“AOC”)** means a discrete, discernible area of known
51 RACS.

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55 **“Certified Asbestos Building Inspector” (“CABI”)** means a person trained and
56 certified in accordance with Air Quality Control Commission Regulation No. 8 (5 CCR
57 1001-10, Part B), for the identification of asbestos-containing materials and the
58 collection of samples to determine asbestos content.

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62 **“Debris”** means any discarded material that contains or consists of any of the
63 following: construction, renovation and demolition debris (regardless of how it was
64 generated), building or facility components, components of building systems (HVAC,
65 plumbing, electrical, control, fire protection, roofing), components of pavement or
66 drainage systems, industrial or machinery components, and/or mechanical components
67 from motorized vehicles.

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71 **“Friable asbestos-containing material”** means any asbestos containing material that
72 contains asbestos and when dry can be crumbled, pulverized, or reduced to powder by
73 hand pressure and that contains more than one percent asbestos by weight, area, or
74 volume. The term includes non-friable forms of asbestos after such previously non-
75 friable material becomes damaged to the extent that it has been or will be when dry it
76 can be crumbled, pulverized, or reduced to powder by hand pressure as determined in
77 the field by a CABI.

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Comment [Denver1]: Drafting suggestion for clarification and consistent use of terminology

Comment [A2]: Issue: Applicability – friable

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81 “Geofabric” for the purposes of Section 5.5 means a permeable fabric or synthetic
82 material placed between RACS and other material that is not RACS to delineate, isolate
83 and separate RACS from other material.

Comment [A3]: Drafting suggestion. The definition should simply define the term, not explain when/how geofabric should be used.

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86 “Minimize” for purposes of implementing the requirements of section 5.5 means
87 reduce and/or prevent to the extent achievable using control measures that are
88 technologically available and economically practicable and achievable in light of best
89 industry practice.”

Comment [A4]: Issue: enforceability – prevent vs. minimize. This definition is a slight restatement of the definition proposed by the Department in the draft discharge permits to be issued to Phase II Municipal Separate Storm Sewer Systems and the Colorado Department of Transportation.

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93 **“Non-Regulated Asbestos Contaminated Soil” (“Non-RACS”) means soil or debris**
94 **that contains only:**

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96 1) Intact non-damaged, non-friable asbestos-containing materials or non-friable
97 asbestos-containing material that has not been damaged to the extent that it has
98 been crumbled, pulverized or reduced to powder as determined in the field by a
99 CABI;

Comment [A5]: Issue: Applicability – friable

100
101 2) Non-friable asbestos-containing materials that do not have a high probability to
102 release fibers based on the forces expected to act upon the material as
103 determined in the field by a CABI. The following asbestos-containing materials
104 are predetermined to be Non-RACS:

- 105
106 a. Resin based materials including but not limited to phenolic-plastic
107 (Bakelite), used in electrical and mechanical parts
108
109 b. Resilient flooring (vinyl, asphalt, rubber) excluding non-tar impregnated
110 friable felt backing on sheet vinyl flooring (linoleum)
111
112 c. Tar impregnated or asphaltic materials in good condition that have not
113 become brittle
114
115 d. Elastic, pliable, or rubberized materials, including but not limited to:
116
117 i. Pliable duct sealant
118
119 ii. Pliable fiberglass insulation sealant
120
121 iii. Pliable fire-stop caulking /sealants
122
123 iv. Pliable window and door caulking

- e. Extremely hard materials, coatings and sealants including but not limited to:
- i. Laboratory countertops and sinks
 - ii. Epoxy type Concrete Masonry Unit (CMU) coatings
 - iii. Epoxy type panel adhesive
 - iv. Duct sealant
 - v. Ceiling tile adhesive
- f. Other asbestos-containing materials as approved by the Department.

"Project" means any soil disturbing activity that involves RACS within a planned geographic area(s) of disturbance, as defined in the Notification of RACS Disturbance form submitted for that specific management or remediation scope, starting from the time of first RACS disturbance and continuing through final RACS removal or stabilization and final demobilization. A project may include one or more Regulated Work Areas (RWAs), and start dates and stabilization dates for individual RWAs within a project may be different.

"Project Specific RACS Management Plan" ("PSRMP") means a RACS management plan for a single project submitted in accordance with Section 5.5.5(A).

"Qualified Project Monitor" ("QPM") means an individual who has the training and/or experience necessary to identify materials suspected of containing asbestos ~~fibers~~ and who has the authority to make prompt decisions relating to the management of such materials, and who meets the training requirements in Section 5.5.3.

Comment [A6]: Issue:
Applicability – single fiber

"Regulated Asbestos Contaminated Soil" ("RACS") means soil, ash or debris (plus 6 inches in all directions of surrounding soil or other matrix material) containing:

- 1) ~~Visible friable~~ **Friable** asbestos-containing materials;

Comment [A7]: Issue:
Applicability – visible

2) Visible Asbestos-containing materials that have been ~~broken/resized/damaged to the extent that they have been, and have a high probability of becoming,~~ crumbled, pulverized, or reduced to powder, or will release asbestos during the soil disturbance releasing fibers from the forces expected to act upon the material, as determined by a CABI in the field. The following visible asbestos-containing materials are RACS if they have been ~~broken/resized/damaged to the extent that they have been or will be, and have a high probability of becoming,~~ crumbled, pulverized, or reduced to powder, or will release asbestos releasing fibers from the forces expected to act upon the material during the soil disturbance, as determined by a CABI in the field:

Comment [A8]: Issue:
Applicability – visible, friable

- a. Asbestos cement materials
- b. Plaster
- c. Brittle caulking, glazing and sealants
- d. Powdery Concrete Masonry Unit (CMU) sealant
- e. Powdery floor leveling compound
- f. Drywall/wallboard and associated joint compound material
- g. Firebrick
- h. Deteriorated non-friable materials that are in poor condition due to weathering, mechanical impact, fire damage (by evidence of ACM within an ash layer) or other factors
- i. Other material as determined by the Department, at the request of the person disturbing debris, to have a high probability to release fibers

3) In the absence of visible ACM as described above in subparagraphs 1 and 2, soil ~~Soil~~ or ash known to contain one percent (1%) or more, by weight, area or volume of non-visible asbestos based on documented evidence.

Comment [A9]: Issue:
Applicability – non-visible threshold.

“Regulated work area” (“RWA”) as used in Section 5.5 of these Regulations means the portion(s) of a site at which soil disturbing activities involving RACS occur.

“**Staging**” for the purposes of Section 5.5, means the accumulation of RACS in the RWA for twelve (12) hours or less.

“**Standard Operating Procedure**” (“**SOP**”) means a RACS management plan for multiple projects submitted in accordance with Section 5.5.5(B).

“**Stockpiling**” for the purposes of Section 5.5, means the accumulation of RACS that will exist for more than 12 hours, up to and including ten (10) calendar days.

“**Storage**” for the purposes of Section 5.5, means the accumulation of RACS greater than ten (10) days, but not exceeding six (6) months unless a longer timeframe is approved by the Department or the duration of the project, whichever is shorter.

Comment [A10]: Drafting suggestion – for internal consistency with para. 5.5.7(H)(3)(g) at page 35.

“**Visible**” means ~~capable of being~~ seen with the unaided eye in the exercise of reasonable care.

Comment [A11]: Issue: enforceability - strict liability vs. standard of care

2) Section 1.2 is being amended by revising the following definitions to read as follows:

1.2 Definitions

“**Adequately wet**” means ~~sufficiently mix or penetrate with liquid to completely prevent the release of particulate material and fibers into the ambient air. If visible emissions are observed coming from asbestos contaminated soil or asbestos containing material, then the material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wet.~~ **WET TO MINIMIZE VISIBLE EMISSIONS OF DUST AND/OR DEBRIS WITHIN THE REGULATED WORK AREA AND PREVENT MINIMIZE [ALTERNATIVE: AND WITH THE GOAL OF PREVENTING] THE RELEASE OF VISIBLE EMISSIONS FROM LEAVING THE REGULATED WORK AREA (RWA) IN ACCORDANCE WITH SECTION 5.5 OF THESE REGULATIONS. THE OBSERVANCE OF VISIBLE EMISSIONS, OUTSIDE OF THE RWA, OF DUST AND/OR DEBRIS MAY BE AN INDICATION THAT SOILS ARE NOT ADEQUATELY WET.**

Comment [A12]: Issue: enforceability – prevent vs. minimize.

“Asbestos” means the asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), amosite (cummingtonite-grunerite), anthophyllite, ~~and actinolite~~ AND tremolite.

“Asbestos-containing material” (“ACM”) means any material that contains more than one percent (1%) asbestos, ~~by weight, area or volume.~~

“Friable asbestos waste” means any asbestos waste that ~~HAS BEEN~~ OR can be pulverized or reduced to powder by hand pressure when dry.

Comment [A13]: Issue: Applicability – rendered friable

“Mechanical” means operated or produced by mechanism, ~~tool~~ or machine. ~~This may include, but shall not be limited to, an excavator, backhoe, grader, tiller, auger, or hand shovel.~~

Comment [A14]: Drafting suggestion: Denver recommends deletion of the newly added term “tool”. Its inclusion will conflict with work practices for removal using hand methods (see p. 29 at line 1249) if hand removal is accomplished with a tool such as a shovel or even a garden trowel.

“Soil-disturbing activities” means ~~excavation, grading, tilling, or any other mechanical activity used to disturb the soil.~~ DIGGING, EXCAVATING, STAGING, LOADING, STOCKPILING, BACKFILLING, COMPACTING, GRADING, TILLING, DRILLING, INTRUSIVE SAMPLING, AND EQUIPMENT OR VEHICLE MOVEMENT OR ANY OTHER MECHANICAL ACTIVITY, THAT WHEN USED, DISTURBS THE SURFACE AND/OR SUBSURFACE SOIL. FOR THE PURPOSES OF SECTION 5.5 DISTURBANCE OR REMOVAL OF SOLID WASTE DEBRIS AND/OR RACS IS CONSIDERED A SOIL DISTURBING ACTIVITY. FOR THE PURPOSES OF SECTION 5.5 HAND DISTURBANCE OR REMOVAL OF RACS IS SUBJECT TO THIS REGULATION, BUT IS NOT CONSIDERED TO BE A MECHANICAL DISTURBANCE.

Comment [A15]: Issue: Applicability – historic fill. Historically deposited fill only becomes solid waste when it is generated which happens at same time as removal of debris. Hence, the definition should be written in terms of the defined term “debris” and/or RACS.

“Visible emissions” means ~~any emissions which are visually detectable without the aid of instruments, coming from material containing asbestos, asbestos waste, asbestos-contaminated soil, or from handling and disposal of asbestos waste, material containing asbestos or asbestos-contaminated soil.~~ ANY AIRBORNE OR LIQUID EMISSIONS, COMING FROM, OR HAVING COME INTO CONTACT WITH RACS, WHICH ARE VISUALLY DETECTABLE DETECTED WITHOUT THE AID OF INSTRUMENTS. PROPER DISPOSAL OF APPROPRIATELY FILTERED DECONTAMINATION WATER TO A SANITARY SEWER DOES NOT CONSTITUTE A VISIBLE EMISSION.

Comment [A16]: Issue: enforceability - strict liability vs. standard of care

Comment [A17]: Drafting suggestion to clarify that proper disposal, rather than disposal to a sanitary sewer, is the standard --- as stated in other parts of the proposed regulation. E.g., sections 5.5.7 (G)(2)(a)3 at p. 32, line 1385; 5.5.7(H)(1)b) at p. 33, line 1403.

3) Section 1.2 is being amended by deleting the definition of “Asbestos-contaminated soil” as follows:

1.2 Definitions

~~“Asbestos-contaminated soil” means soil containing any amount of asbestos.~~

4) A Table of Contents for Section 5 (Asbestos Waste Management) is being added to the regulations to read as follows:

SECTION 5

ASBESTOS WASTE MANAGEMENT

- 5.1 General Provisions
- 5.2 Non-Friable Asbestos Waste Disposal Areas
- 5.3 Friable Asbestos Waste Disposal Areas
- 5.4 Storage of Asbestos Waste
- 5.5 Management of Regulated Asbestos-Contaminated Soil (RACS)
 - 5.5.1 Scope and Applicability
 - 5.5.2 Exemptions
 - 5.5.3 Training ~~and Outreach~~
 - 5.5.4 Response for Unplanned RACS Discovery
 - (A) Immediate Actions
 - (B) 24-Hour Notification Requirements
 - (C) Interim Actions
 - 5.5.5 Response for Planned RACS Management
 - (A) Project Specific RACS Management Plan (PSRMP)
 - (B) Standard Operating Procedures (SOPs)
 - (C) Standard Requirements of Section 5.5.7
 - 5.5.6 Remediation of Asbestos in Soil
 - 5.5.7 Standard Requirements for the Disturbance of RACS
 - (A) Establishment and Control of a Regulated Work Area (RWA)
 - (B) Personal Protective Equipment (PPE) for the Purposes of Preventing Cross-Contamination
 - (C) Wetting

- (D) Wind Speed Monitoring
- (E) Air Monitoring
- (F) Work Practices to be Followed During RACS Disturbance
- (G) Loading and Placement of RACS
- (H) Onsite Staging, Stockpiling, and Storage of RACS
- (I) Decontamination
- (J) RACS Spill Response
- (K) Requirements for Exposed RACS Remaining in Place
- (L) Documentation

5.5.8 Packaging and Disposition of Regulated Asbestos-Contaminated Soil

- (A) Disposal of RACS
- (B) Onsite reuse of RACS

Comment [A18]: Drafting suggestion, for consistent level of detail in table of contents)

5.5.9 Fees

Appendix 5A: Sample Collection Protocols and Analytical Methodologies

5) The existing Section 5.5 Regulations (Management of Asbestos-Contaminated Soil) are being deleted in their entirety and replaced with new Section 5.5 Regulations (Management of Regulated Asbestos-Contaminated Soil (RACS)) to read as follows:

SECTION 5

ASBESTOS WASTE MANAGEMENT

5.5 MANAGEMENT OF REGULATED ASBESTOS-CONTAMINATED SOIL (RACS):

5.5.1 SCOPE AND APPLICABILITY

(A) Any person who disturbs debris or encounters debris during a soil disturbing activity shall have protocols to characterize visible debris as ACM, suspect ACM, or non-ACM and as RACS or Non-RACS, waste for appropriate management, disposal, or re-use, and appropriate personnel to implement those protocols. Any person who disturbs debris or encounters debris during a soil disturbing activity shall:

Comment [A19]: Issue: applicability to ACM/RACS not solid waste broadly

(1) Conduct visual assessment of disturbed material;

(2) If debris is encountered, and/or the soil or ash is known to contain asbestos fibers, through documented evidence, then Section 5.5 is applicable. If there is

no visible RACS or documented evidence of RACS at a site, an owner/operator does not have a duty under these regulations to sample or otherwise investigate for RACS prior to commencing soil disturbing activities;

(3) If debris is encountered that only contains green waste, and/or natural stone with no associated material suspected of containing asbestos fibers, then Section 5.5 is not applicable.

(4) In the event of an emergency in which a soil disturbing activity in an area of debris must continue or commence at once, a RACS determination in accordance with Section 5.5.1(B) may be postponed during the initial response to the immediate emergency. However, the RACS determination must be made within 48 hours of the initial emergency response.

(5) Any person who encounters but does not disturb debris during a soil disturbing activity shall have protocols to characterize debris as required by this section 5.5.1(A) and stabilize any debris determined to be RACS as required by Section 5.5.7(K), unless the debris is exempted by subsection 5.5.2(A) through (F).

(B) Any person who disturbs debris during soil disturbing activities, when the subject debris is not excluded within 5.5.1(A)(3), must inspect the debris, through continuous visual observation during soil disturbing activities, to determine if the debris is, or contains, suspect asbestos-containing material. If debris is encountered that only contains metal, glass, plastic, wood, and/or bare concrete with no associated material suspected of being asbestos-containing material (ACM) (such as sealants, adhesives, mastics, coatings, adhered materials, or resins), then Section 5.5 is not applicable. The visual inspection shall be conducted in a manner **reasonably** sufficient to provide thorough inspection of the debris being disturbed, while maintaining the safety of the inspector. The person(s) visually inspecting the debris must be a Qualified Project Monitor (QPM) or a Certified Asbestos Building Inspector (CABI).

Comment [A20]: Issue: standard of care: reasonable vs. strict liability

All suspect asbestos-containing materials must be:

(1) Assumed to be ACM; or

(2) Sampled by a CABI. The samples shall be analyzed by a National Voluntary Laboratory Accreditation Program (NVLAP) participating laboratory utilizing Polarized Light Microscopy (PLM) (EPA Method 600/R-93/116 or equivalent) to determine if it is ACM; or

(3) Determined to be ACM, or non-ACM, through the use of documentation **unique specific** to the material observed in the field establishing the asbestos content of

the material (e.g. laboratory analysis results from previous encounters with the same material).

(4) The asbestos determination shall be made within seven (7) calendar days of discovery of the debris.

(a) Within 24 hours of discovery of debris, and until the asbestos determination is made, the debris shall be stabilized in accordance with Section 5.5.4(A)(3) of these regulations.

(b) No additional disturbance, other than as necessary to perform the required stabilization in Section 5.5.4(A)(3), of the debris shall occur prior to the asbestos determination.

Comment [A21]: Drafting suggestion

(5) A person who disturbs debris, determined or assumed to be or contain ACM per 5.5.1(B), shall determine if the ACM is exempted in accordance with Section 5.5.2 of these regulations.

(6) A person who disturbs debris, determined or assumed to be or contain ACM per 5.5.1(B), shall make a RACS vs. Non-RACS determination, as the terms are defined in Section 1.2 of these regulations, by:

(a) Assuming the debris containing asbestos is RACS and managing the RACS in accordance with Section 5.5 of these regulations; or

(b) Applying site and material specific generator knowledge of the presence or absence of RACS based on observation and/or documented evidence about the nature of asbestos-containing material(s).

Comment [A22]: Drafting suggestion for clarification.

(7) The owner/operator shall retain, or make available for inspection, records of all RACS vs. Non-RACS determinations onsite for the duration of the debris disturbance, and which shall be retained by the owner/operator for a period of six months after the completion of debris disturbing activities.

(C) Soil or ash known to contain one percent (1%) or more non-visible asbestos, based on documented evidence, is RACS and shall be managed in accordance with these regulations.

Comment [A23]: Issue: Applicability – threshold for non-visible

(D) If soil, ash, or debris is, or contains, RACS then:

(1) RACS that is disturbed shall be managed, disposed of, or reused in accordance with this section 5.5 these regulations.

Comment [A24]: Drafting suggestion for clarification.

(2) Removal of asbestos-containing material that is on, or comprises, a facility component, that is located on or in soil that will be disturbed, shall be conducted under this Section 5.5, in accordance with work practices in Air Quality Control Commission Regulation No. 8 (5 CCR 1001-10, Part B), Section III.V, and is not subject to the permit requirements of 5 CCR 1001-10, Part B, if the total quantity of asbestos-containing material is below the following trigger levels:

- (a) 260 linear feet on pipes; or
- (b) 160 square feet on other surfaces; or
- (c) The volume of a 55-gallon drum.

(3) RACS that is generated and not disposed of or reused in compliance with Section 5.5.8 of these Regulations is solid waste and shall be managed in accordance with the landfill requirements of the Colorado Solid Wastes Disposal Sites and Facilities Act (C.R.S. 30-20, Part 1) and the Regulations Pertaining to Solid Waste Sites and Facilities (6 CCR 1007-2, Part 1).

(4) A person who disturbs RACS shall make the decision upon the initial discovery of RACS to either manage the RACS in accordance with Section 5.5, or cease soil disturbing activities and permanently stabilize the disturbed RACS to control the release of asbestos **fibers** in accordance with one of the following:

Comment [A25]: Issue: applicability – single fiber

- (a) Cover RACS with geofabric, or equivalent visible barrier, and restore the site to pre-disturbance conditions using fill suitable for unrestricted use; or
- (b) Cover RACS with geofabric, or other visible barrier, followed by 18 inches of fill suitable for unrestricted use, and vegetation; or
- (c) Cover RACS with geofabric, or other visible barrier, followed by 6 inches of fill suitable for unrestricted use, and concrete or asphalt; or
- (d) Cover RACS with geofabric, or other visible barrier, followed by fill suitable for unrestricted use to grade for vertical excavation faces or trenches; or
- (e) Alternate cover designs as approved by the Department.

5.5.2 EXEMPTIONS

(A) Removal of asbestos-containing material on a facility component with asbestos quantities above the trigger levels, as defined in 5.5.1(D)(2), is subject to the permit and abatement requirements of Air Quality Control Commission Regulation No. 8 (5

CCR 1001-10, Part B), and is therefore not subject to this Section 5.5., but shall still comply with Sections 5.1 through 5.4 of these regulations.

- (B) Spill response activities that are subject to the requirements of Air Quality Control Commission Regulation No. 8 (5 CCR 1001-10, Part B) are not subject to the requirements of Section 5.5, but shall still comply with Sections 5.1 through 5.4 of these regulations.

- (C) Ambient occurrences of asbestos fibers in soil that are demonstrated to be the result of background conditions and not the result of site specific activities are not subject to the requirements of this Section 5.5. This background A demonstration shall may be submitted to ,and approved by, the Department for concurrence that the exemption is applicable prior to the exemption being exercised.

Comment [A26]: Issue: Applicability. An exemption stands on its own. Even if the Department disapproves, if an ambient occurrence is the result of background conditions and not the result of site specific activities, the exemption should be available as a matter of law. The Department is not the final arbiter

- (D) During active solid waste disposal operations, asbestos waste disposal areas that have a certificate of designation are not subject to 5.5, but shall comply with the facility's Engineering Design and Operations Plan.

Comment [A27]: Applicability – single fiber

- (E) De minimis projects involving a total RACS disturbance of less than 1 cubic yard, using low-emission methods, are exempt from this Section 5.5, except for the decontamination procedures in 5.5.7(I) and the disposal requirements in 5.5.8. For the purpose of this Section 5.5, Low Emissions Methods means soil disturbing activities that will not result in visible emissions without the use of wet methods.

- (F) Projects conducted directly by a homeowner on their primary residence not used for the purpose of generating of income, including residential landscaping projects and other private residential soil-disturbing projects conducted after the primary dwelling is built, e.g. such as planting trees, digging holes for fence posts, installing sign posts, gardening, other such projects done conducted by private individuals homeowners on their primary place of a residence not used for the purpose of generating of income, are not subject to this Section 5.5, but shall still comply with Sections 5.1 through 5.4 of these regulations.

Comment [A28]: Applicability – historic fill is not subject to regulation unless/until it is newly generated. Alternative: revise SBP to clarify legal standing of historic fill (i.e., not regulated unless newly generated).

- (G) Soil disturbing activities involving Non-RACS, where no RACS is present or generated, are not subject to the requirements of Section 5.5. but Non-RACS must be disposed as non friable asbestos waste in accordance with the disposal requirements set forth in Section 5.2 of these regulations. However, if Non-RACS is not removed during a remediation project conducted under Section 5.5.6, an environmental covenant may be necessary to the extent that it is required by § 25-15-320 C.R.S.

Comment [A29]: Drafting issue. It is not appropriate to restate what is required by 5.2, which regulates disposal sites, in this statement of 5.5 exemptions. The stricken clause does not relate to O/O of soil disturbing projects. 5.2 will apply according to its own terms.

- (H) Soil disturbing activities involving debris that only contains metal, glass, plastic, wood, and/or bare concrete with no associated material suspected of being asbestos-containing material (ACM) (such as sealants, adhesives, mastics,

coatings, adhered materials, or resins), as determined by a CABI, QMP, or generator knowledge, is not subject to the requirements of Section 5.5.

- (I) Soil disturbing activities involving debris that only contains green waste or natural stone is not subject to the requirements of Section 5.5.

5.5.3 TRAINING-AND-OUTREACH

- (A) Projects involving the disturbance of debris or soil/ash containing debris shall include at least one onsite QPM during active disturbance.

- (B) Personnel inside the RWA during the disturbance of RACS shall have annual awareness training. This training requirement applies to equipment operators and drivers of trucks carrying contaminated material for offsite disposal or reuse. Truck drivers who do not complete this training are ancillary workers. Soil disturbing activities must cease if the truck driver is present within the RWA unless the driver remains in the cab of the truck, the truck's windows and doors remain closed, and the air handling system remains off while the truck is inside the RWA. This training shall cover information necessary to comply with Section 5.5 requirements and the approved PSMRP or SOP (if any) including:

- 1) General asbestos awareness; including health effects; and
- 2) Overview of the requirements of Section 5.5; and
- 3) Overview of suspect ACM that requires further evaluation by a CABI; and
- 4) Overview of RACS and Non-RACS; and
- 5) Worker protection, including levels of personal protective equipment (PPE) required for various activities and conditions; and
- 6) Decontamination requirements for equipment and personnel; and
- 7) Engineering controls to minimize [alternative: with the goal of preventing] in order to prevent the release of asbestos outside the RWA; and
- 8) Overview of RACS handling procedures. This training shall be conducted by a CABI or QPM who is familiar with the site specific plan and/or the Standard Requirements in Section 5.5.7. Records of this training shall be retained, by the owner/operator trained individual, and be available for inspection, for a minimum of one year from the date of the training.

Comment [A30]: Issue: enforceability – prevent vs. minimize

Comment [A31]: Drafting suggestion: as a matter of practicality, individuals will not keep their training records or their records will be difficult to locate for inspection. 5.5 is written to pertain to O/Os; O/Os will not be able to control whether individual employees comply with this responsibility.

602 (C) ~~Personnel inside the RWA during the disturbance of RACS shall have P~~er-project
603 site-specific awareness training for personnel disturbing RACS. This training shall
604 cover site-specific information necessary to comply with Section 5.5 and the
605 selected management approach for the project (project specific RACS management
606 plan (PSRMP), standard operating procedures (SOPs), or the standard
607 requirements of Section 5.5.7, including project chain-of-command and identification
608 of authorized personnel with stop work authority, and identification of QPM(s). This
609 training shall be provided by a CABI or QPM. Records of this training shall be
610 retained, and be available for inspection, for the duration of the project for which the
611 training was conducted.

Comment [A32]: Drafting suggestion: The Jan 15 revision proposed by the Division should be rejected. Other regulations focus on the persons doing the work and allow for access with awareness training and escorts. These persons are sufficiently covered by (B).

612
613 (D) Qualified Project Monitors shall have, at a minimum:

- 614
615 1) Annual awareness training and site specific awareness training under Section
616 5.5.3(C) and (D); and,
- 617
618 2) Training from a CABI on identifying debris, exempted materials under Section
619 5.5.1(A)(3), and the assumption of debris to be RACS as outlined in Section
620 5.5.1; and,
- 621
622 3) Training from a CABI on how to implement the standard requirements under
623 Section 5.5.7 and how to perform the duties that a QPM may perform in lieu of a
624 CABI; and
- 625
626 4) Training from a CABI on how to implement the provisions of the chosen RACS
627 management approach (PSRMP, SOPs, or standard requirements of Section
628 5.5.7) and how to perform the duties that a QPM may perform in lieu of a CABI;
629 and,
- 630
631 5) 40 verifiable hours of direct experience on projects conducted under Section 5.5.

632
633 (E) Inspection and identification of RACS shall be conducted by a CABI in the exercise
634 of reasonable care, with 40 verifiable hours of on the job asbestos in soils
635 experience on a minimum of three (3) different asbestos in soils jobs, conducted
636 under either AQCC Regulation No. 8 or Section 5.5. The CABI shall be independent
637 of the general contractor (GC) and/or abatement contractor unless the CABI and the
638 GC or abatement contractor are both direct employees of the property owner.
639 However, the GC or abatement contractor may hire a subcontractor CABI, but the
640 CABI shall not be a direct employee of the GC or abatement contractor.

Comment [A33]: Issue: standard of care vs. strict liability

641
642 (F) Air monitoring conducted in accordance with this Section 5.5 shall be performed by
643 an Air Monitoring Specialist (AMS).
644
645

5.5.4 RESPONSE ~~FOR TO~~ UNPLANNED RACS DISCOVERY

Soil disturbing activities that ~~encounter~~ disturb or will disturb RACS without previously approved plans are subject to the following requirements:

Comment [A34]: Issue: Applicability – encounter vs. disturb. Denver’s suggested distinction for encounter vs. disturb is consistent with 5.5.1.

(A) IMMEDIATE ACTIONS: Immediate actions shall be taken by the person conducting the soil disturbing activity, or representative of the owner or operator, to manage RACS in accordance with Section 5.5 and Section 1.2 definitions of these Regulations. These actions shall include, at a minimum, the following:

(1) Stopping all soil disturbing activities, related to RACS, until the 24-hour notification requirements in Section 5.5.4(B), and the interim action requirements in Section 5.5.4(C), are met. In the event of an emergency in which a soil disturbing activity must continue or commence at once, notification shall be made as soon as possible, but within 24 hours of identifying or assuming the presence of RACS within the soil disturbing area. During the initial response to the immediate emergency, the standard requirements of Section 5.5.7 shall be implemented to the extent possible. Within 48 hours, any disturbed and/or exposed RACS shall be managed in accordance with the standard requirements of Section 5.5.7, an approved PSRMP, or an approved SOP.

(2) Establishing, and taking measures ~~in order to prevent~~ to minimize ~~[alternative: with the goal of preventing]~~ access to, the regulated work area by unauthorized persons. ~~Instances of unauthorized access not under the control of the owner/operator shall be evaluated to determine if additional access controls are warranted. The unauthorized access, and the response actions taken, shall be documented and provided to the Department within 48 hours of the incident.~~

Comment [Denver35]: Issue: Enforceability – prevent vs. minimize.

(3) Conducting interim surface soil stabilization to reduce emissions including:

- a. Polyethylene sheeting or geotechnical fabric with daily inspection, and inspection after storm events, and repair/replacement of sheeting as necessary to maintain stabilization; or
- b. Chemical stabilizer demonstrated to be effective in the stabilization of RACS (e.g. magnesium chloride) with weekly inspection, and inspection after storm events, and re-application of chemical stabilizer as necessary to maintain stabilization; or
- c. Minimum of 3 inches of soil appropriate for unrestricted use; or
- d. Other means of stabilization as approved by the Department.

- e. Stabilization is not required if RACS is kept adequately wet. Verification of adequately wet conditions shall be conducted at least every two hours, or RACS shall be stabilized.

(B) 24-HOUR NOTIFICATION REQUIREMENTS: The owner/operator, or owner/operator representative shall submit a completed Notification of RACS Disturbance form to the Department's Hazardous Materials and Waste Management Division within 24 hours of ~~encountering~~ disturbing RACS during a soil disturbing activity.

Comment [A36]: Issue: Applicability – encounter vs. disturb

(C) INTERIM ACTIONS: In accordance with 5.5.5, the owner/operator, or owner/operator representative, shall submit to the Department's Hazardous Materials and Waste Management Division, for review and approval, within five (5) working days of the discovery, PSRMP, SOPs, or indicate the standard requirements of Section 5.5.7 will be followed on the Notification of RACS Disturbance form submitted to the Department.

(D) Once the requirements of Sections 5.5.4(A), (B), and (C) are completed, any soil disturbing activities shall proceed in accordance with applicable requirements.

5.5.5 RESPONSE FOR PLANNED RACS MANAGEMENT

Planned soil disturbing activities involving RACS in regulated work areas shall be conducted in accordance with the standard requirements identified in Section 5.5.7, and with one of the following management strategies and the associated notification requirement:

(A) PROJECT SPECIFIC RACS MANAGEMENT PLAN (PSRMP);

(1) The owner/operator, or owner/operator representative, shall submit a completed Notification of RACS Disturbance form to the Department's Hazardous Materials and Waste Management Division at least 10 working days prior to any planned soil disturbing activity. This notification shall include submittal of a Project Specific RACS Management Plan (PSRMP) conforming to the requirements of Section 5.5.5(A)(2). The ~~Division~~ Department will acknowledge receipt of a notification of the intent to utilize a PSRMP by mail or electronic correspondence. The PSRMP shall be approved by the Department prior to implementation.

(2) If the owner/operator choose(s) management in accordance with this Section 5.5.5(A), a PSRMP shall be developed and submitted to the Department's Hazardous Materials and Waste Management Division for review and approval prior to implementation. The Department will use its best efforts to review and

respond to the plan within ten (10) working days of receipt. The PSRMP shall include the following:

- (a) Property representative's name and phone number; and
- (b) Property location; and
- (c) General site description, including a description of RACS and the types of known or assumed asbestos-containing material(s), and the location(s) of these material on the site; and
- (d) Description of planned soil disturbing activities; and
- (e) Description of site management, emission control activities, and work practices to control the release of, and/or exposure to, asbestos outside of the RWA including:
 - (i) Measures to assure that the soil is adequately wet (as that term is defined in Section 1.2 of these regulations), stabilized, or covered during soil disturbing activities; and
 - (ii) Wind speed monitoring during RACS disturbance, including frequency of monitoring, and shutdown and start up criteria; and,
 - (iii) An air monitoring plan designed to detect asbestos at the perimeter of the RWA as an indication that the measures to control the release of ~~and/or exposure to~~, asbestos outside of the RWA are effective. The plan may include a tiered air monitoring approach providing less frequent air monitoring given demonstrated effectiveness of work practices; and,
 - (iv) Work practices specific to mechanical and/or hand disturbance of RACS including measures ~~in order to prevent to minimize~~ alternative: with the goal of preventing the release of visible emissions outside of the RWA; and,
 - (v) Work practices for the loading and placement of RACS including spill prevention procedures.
 - (vi) The owner /operator has the option to erect a structure maintained at a negative pressure differential sufficient to contain all dust, with off-gas from the evacuation system treated with HEPA filtration. If this option is chosen, the requirement to submit an air monitoring plan, under 5.5.5(A)(2)(e)(iii) is not applicable.

Comment [A37]: Drafting suggestion. Striking reference to exposure is consistent with 5.5.7(E)(1) at line 1011 which now speaks in terms of indicating 'effectiveness of work practices, not for risk evaluation'. Exposure is a risk concept.

Comment [A38]: Issue: Enforceability - prevent vs. minimize

and,

(f) Description and location of any planned sampling. All sampling shall be performed in accordance with the procedures set forth in Appendix 5A. All investigation derived waste shall be managed in accordance with 5.5.8.

(3) A copy of the PSRMP shall be maintained on the site during RACS disturbing activities.

(4) At the option of the owner/operator and upon notice to the ~~Division~~Department, a Soil Characterization and Management Plan approved prior to the effective date of the ~~is~~ amended ~~Section 5.5~~regulation, and that complies with the substantive requirements of the regulation prior to amendment, shall remain in effect until the completion of the subject project or until it is replaced by a PSRMP.

(B) STANDARD OPERATING PROCEDURES (SOPs)

(1) The owner/operator, or owner/operator representative, shall notify the Department's Hazardous Materials and Waste Management Division, by submitting a completed Notification of RACS Disturbance form, prior to implementation of the previously approved SOPs at a RWA. SOPs that conform to Section 5.5.5(B)(2) shall be approved by the Department prior to implementation. The Department will acknowledge receipt of a notification of the intent to utilize an SOP by mail or electronic correspondence.

(2) If the owner/operator chooses management in accordance with this Section 5.5.5(B), the owner/operator shall develop and submit to the Department's Hazardous Materials and Waste Management Division, for review and approval, thirty (30) calendar days in advance of any RACS disturbing activities, SOPs that conform with Section 5.5.5(A)(2)(a) – (f) that will be implemented, upon notice to the Department per Section 5.5.5(B)(1), at future regulated work areas. A copy of the SOPs shall be maintained on site during RACS disturbing activities for the duration of the Project.

(3) At the option of the owner/operator and upon notice to the ~~Division~~Department, a Standard Operating Procedure approved prior to the effective date of the ~~is~~ amended ~~Section 5.5~~regulation, and that complies with the substantive requirements of the regulation prior to amendment, shall remain in effect and may be used to comply with the amended regulation.

(C) STANDARD REQUIREMENTS OF SECTION 5.5.7

The owner/operator, or owner/operator representative, shall submit to the Department's Hazardous Materials and Waste Management Division a completed Notification of

RACS Disturbance form indicating the intent to utilize the standard requirements of Section 5.5.7, as a default RACS management plan, prior to any planned soil disturbing activity. This notification shall include property location, general site description, and contact information for the owner/operator responsible for the regulated work area activities. The Department will acknowledge receipt of a notification of the intent to utilize the standard requirements of Section 5.5.7 by mail or electronic correspondence.

(D) RISK BASED APPROACH

The owner/operator may choose to submit, for ~~Division~~Department review and approval, a site-specific risk assessment work plan to evaluate the risks of the proposed work practices associated with planned disturbance activities in an area or areas of RACS.

5.5.6 REMEDIATION OF ASBESTOS IN SOIL

(A) Remediation is not required of properties at which asbestos-containing material, RACS, or asbestos waste is located. If the owner of a property chooses to remediate (rather than just manage) all or a portion of the property containing ~~ACM, RACS, or asbestos waste RACS~~ and seeks a No Further Action or No Action Determination in accordance with the Voluntary Cleanup and Redevelopment Act (C.R.S. 25-16-301 et seq.), the Resource Conservation and Recovery Act Subtitle D (C.R.S. 30-20, Part 1) or the Resource Conservation and Recovery Act Subtitle C (C.R.S. 25-18-302 et seq.), as may be required by a final enforceable mechanism, a Remediation Plan shall be submitted to the Department's Hazardous Materials and Waste Management Division for review and approval prior to commencement of activities associated with the remediation. The Remediation Plan shall comply with this Section 5.5, and the governing regulatory authority and include the following:

Comment [A39]: Issue: Applicability – this section 5.5 is is/should be limited to management of RACS.

- (1) The standard requirements in accordance with Section 5.5.7, and the plan requirements outlined in Section 5.5.5(A). Alternatively, a risk based approach pursuant to Section 5.5.5(D) may be proposed, for Department review and approval, for disturbance of RACS; and
- (2) A detailed description of planned remediation activities, including proposed depth and areal extent of remediation, ~~and work practices to be implemented~~; and
- (3) The proposed use of the property and area of remediation; and
- (4) Any planned engineering or institutional controls ~~to minimize in order to prevent~~ exposure to any asbestos left in place within the area covered by the Remediation Plan, and

Comment [A40]: Drafting suggestion to avoid duplication/possible conflict with (1). Subpara (1) establishes the work practices as the standard requirements.

Comment [A41]: Issue: Applicability – prevent vs. minimize

(5) A schedule for submittal of a Remediation Completion Report that incorporates the information from Section 5.5.7(L) and any additional information necessary to demonstrate that the remediation goals have been achieved.

(B) The Department shall use its best efforts to provide written notification that a Remediation Plan has been approved or disapproved within no more than forty-five (45) calendar days after a request by a property owner, unless the property owner and the Department agree to an extension of the review to a date certain.

(C) If a remedial decision is made by the Department, the area subject to the remedial decision may be subject to C.R.S. Section 25-15-320(2), and an environmental covenant may be required for waste left in place.

5.5.7 STANDARD REQUIREMENTS FOR THE DISTURBANCE OF RACS

The requirements of this section, if followed in their entirety, constitute a default RACS management plan, eliminating the need to submit a PSRMP or SOP.

(A) ESTABLISHMENT AND CONTROL OF A REGULATED WORK AREA (RWA)

(1) Requirements for establishment and control of a RWA applicable to all projects subject to this Regulation:

(a) Establish a RWA which is identifiable to all persons. Haul roads between RWAs, where RACS is not present, are considered to be outside the RWA(s); however, equipment decontamination [5.5.7(I)] and spill response procedures [5.5.7(J)] shall be followed; and

(b) Stop all soil disturbing activities in the RWA if ancillary workers or members of the public are present within the RWA. Truck drivers who do not complete the training under 5.5.3(C) are ancillary workers. Soil disturbing activities must cease if the truck driver is present within the RWA unless the driver remains in the cab of the truck, the truck's windows remain closed, and the air handling system remains off while the truck is inside the RWA; and

(c) Post labeling and signage to demarcate RWA(s). The RWA shall be demarcated with a visual means that fully defines the extent of the RWA. Labeling and signage shall indicate the presence of asbestos, and that the area is off limits to unauthorized personnel.

(2) **Additional Requirement for Projects Disturbing RACS Containing Friable ACM.** Establish a secured work site (e.g., fencing with locks/zip-ties/chains). Personnel, or staff assigned to this duty, may be used to secure the RWA in lieu

of fencing. If the RWA is located within a larger secure facility, fencing of the RWA is not necessary as long as the RWA is secured.

(B) PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR THE PURPOSES OF PREVENTING CROSS-CONTAMINATION

(1) Requirements applicable to all RWAs subject to this Regulation:

- (a) Use of disposable booties or impermeable footwear that will be decontaminated per 5.5.7(I); and
- (b) Use of disposable gloves or impermeable gloves that will be decontaminated per 5.5.7(I); and
- (c) Replace or decontaminate (per 5.5.7(I)) all PPE ~~as necessary to prevent contamination from leaving the RWA via cross contamination. This requirement applies to all instances~~ where the integrity of the PPE is compromised, and when workers exit the RWA; and
- (d) Decontaminate (per 5.5.7(I)) or dispose of all used PPE as asbestos contaminated waste.

Comment [A42]: Drafting suggestion – the requirement should be simply stated (as opposed to including the reason for the requirement), namely: replace or decontaminate – as in (a), (b), and (d).

(2) **Additional Requirement Applicable to Projects at RWAs Containing Friable ACM.** Use of disposable impermeable suits or equivalent coveralls, remove suits or coveralls upon exiting the RWA, and dispose of used suits or coveralls as asbestos contaminated waste.

(C) WETTING

(1) Wetting requirements applicable to all RACS disturbance:

- (a) Adequately wet all RACS and soils, or other materials, containing RACS, on the surface and in the sub-surface (as defined in Section 1.2 of the Solid Waste Regulations) prior to and during RACS disturbance, except as provided in 5.5.7(F)(1)(b)(ii). Pre-wetting is not necessary if soils are already adequately wet. Apply water or amended water (as required in 5.5.7(C)(2)) at low pressure ~~in order to prevent to minimize~~ dust generation and splattering at the point of application.
- (b) Continuously mist RACS and soils, or other materials, containing RACS during placement using equipment mounted spray bars, or additional hose operator(s).

Comment [A43]: Issue: enforceability – prevent vs. minimize

~~(c) Incidental occurrences of visible emissions shall be managed by evaluating site conditions and engineering controls for each occurrence of visible emissions, and immediately implementing any identified engineering control revisions necessary in order to prevent future occurrences of visible emissions. All instances of visible emissions leaving the RWA shall be documented as required in Section 5.5.7(L) of this regulation.~~

Comment [Denver44]: Is sue: Enforcement – prevent vs. minimize. Division’s Jan 15 version adds another requirement, which still does not address the prevent vs. minimize issue.

(2) **Additional requirement for RACS that contains friable ACM.** Use amended water containing a wetting agent, such as a 50:50 mixture of polyoxyethylene ester and polyoxyethylene ether, or the equivalent, in a 0.16 percent solution (1 ounce to 5 gallons) of water, or as per manufacturer recommendations for the wetting of asbestos. This requirement may be waived by the Department for emergency situations where the work must occur immediately and wetting agents are not available.

(D) WIND SPEED MONITORING

(1) Requirements applicable to all projects involving mechanical disturbance of RACS, and hand disturbance of RACS containing friable ACM:

(a) Take wind measurements from within the RWA using a hand held anemometer. Alternatively, or in conjunction with hand held measurements, an onsite weather station may be used within a quarter mile of the RWA as long as the conditions measured by the weather station are representative of conditions in the RWA.

- i. Collect wind speed measurements at a minimum of 30 minute intervals and during wind gust(s). Average wind speed measurements shall be obtained manually by taking ten readings at one minute intervals and averaging the ten readings, or through the use of instrumentation that provides a ten minute average wind speed reading.
- ii. If wind break barriers are used, wind speed measurements may be taken from within barriers; however, wind speed measurements shall also be taken outside the wind break barriers if any RACS disturbing activities, such as loading, are taking place outside or above the barriers. Wind speed shut-down criteria shall be based on measurements taken that are representative of the area of active RACS disturbance.

(b) Immediate stoppage of all RACS disturbance shall occur based on results of wind speed monitoring conducted in accordance with subsection (a) and exceedance of the following criteria:

- i. Wind gust(s) in excess of 20 mph, or

994
995 ii. Sustained winds in excess of 12 mph, averaged over 10 minutes, or
996

997 ~~iii. Winds are interfering with the ability of engineering controls to work as~~
998 ~~intended, or~~
999

1000 iv. Winds are creating visible emissions that leave the RWA.
1001

1002 (c) RACS disturbance may resume when all of the following criteria are met:
1003

1004 i. No gust(s) in excess of 20 mph occur for 20 minutes, and
1005

1006 ii. No sustained winds in excess of 12 mph occur for 20 minutes, based on a
1007 10 minute average wind speed measurement, and
1008

1009 ~~iii. Winds are not interfering with the ability of engineering controls to function~~
1010 ~~as intended, and~~
1011

1012 iv. Winds are not creating visible emissions that leave the RWA.
1013

1014 (E) AIR MONITORING 1015

1016 (1) Air monitoring is required during Mechanical Disturbance of RACS in RWAs with
1017 an Adjacent Receptor Zone (as an indication of the effectiveness of work
1018 practices, not for risk evaluation):
1019

1020 (a) No air monitoring is required for RACS disturbance that will not exceed a
1021 duration of 2 days. ~~However, the requirements for adequate wetting~~
1022 ~~(5.5.7(C)) and no visible emissions leaving the RWA (5.5.7(F)) shall be~~
1023 ~~adhered to on all RACS disturbance projects.~~ Dividing projects into multiple 2
1024 day or shorter components shall not be used as a mechanism to avoid air
1025 monitoring requirements.
1026

1027 (b) Area monitoring shall consist of a minimum of four samples collected on the
1028 perimeter of the RWA at appropriate intervals to provide representative
1029 information regarding potential releases of asbestos fibers to the adjacent
1030 receptor zone(s). Additional samples shall be collected for large perimeter
1031 RWAs (greater than 1 acre). RWAs greater than 1 acre shall require
1032 additional perimeter monitoring points be added at a rate of one sample for
1033 every 200 linear feet (or approximately each additional ¼ acre). If
1034 representative information about potential releases to the adjacent receptor
1035 zone(s) can be collected using less than the minimum number of samples,
1036 the remaining sample locations shall be at the discretion of the AMS.
1037

Comment [A45]: Drafting suggestion; i, ii, and iv provide objective criteria that are sufficiently protective. "Interference" in iii. is a subjective, non-ascertainable criterion.

Comment [A46]: Drafting suggestion; i, ii, and iv provide objective criteria that are sufficiently protective. "Interference" in iii. is a subjective, non-ascertainable criterion.

Comment [A47]: Drafting suggestion; it is not necessary/appropriate to repeat the requirements stated earlier. This section pertains to air monitoring and should be limited to that subject.

(c) PCM analysis is required on all samples collected (unless all samples will be analyzed by Transmission Electron Microscope (TEM) by default). The laboratory shall be requested to provide verbal results to the AMS or the QPM by the start of the next working day, or as soon as possible after the start of the next working day, with written results within 24 hours of the receipt of verbal results. A consultation with the Department is required If this timeframe cannot be met by the laboratory as a matter of course throughout the project.

Comment [A48]: Drafting suggestion – to focus on scheduled lab capability and to avoid the requirement if lab is late with results on an individual one-time basis.

(d) Upon receipt of a laboratory report indicating a “cannot be read (CBR)”, or a “not analyzed (NA) or rejected” due to loose debris or uneven loading, analysis result:

- i. The AMS shall evaluate the lab report and any field documentation to determine a possible cause for the CBR or “not analyzed (NA) or rejected” result; and,
- ii. If the CBR or “not analyzed (NA) or rejected” cannot be correlated to a specific field event that compromised the sample (e.g. the sample was blown over, the filter of the sample was sprayed with water, ~~etc.~~) then the sample shall be prepared for indirect TEM presence/absence analysis to determine potential asbestos content in accordance with Appendix 5A; and,
- iii. If the CBR or “not analyzed (NA) or rejected”, analysis result can be correlated to a compromised sample, then preparation for indirect TEM presence/absence analysis is not required as long as adequate air monitoring data is available to evaluate the effectiveness of engineering controls. However, overloading of a sample with particulate matter does not constitute a compromised sample, and will require indirect preparation for TEM presence/absence analysis; and,
- iv. Field personnel shall evaluate why the sample was compromised and modify field procedures as necessary to avoid future samples from being compromised; and,
- v. The Department project manager shall be notified by phone or email of instances of CBR or “not analyzed (NA) or rejected” analysis results within 24 hours of receipt of verbal results.

(e) TEM presence/absence analysis is required (analysis providing fiber counts/concentrations is always optional) as described in paragraphs i through iv below. The laboratory shall be requested to provide verbal results by the start of the next working day, or as soon as possible after the start of

the next working day, with written results within 24 hours of the receipt of verbal results.

i. All samples, required by this Section 5.5, with PCM results having fiber concentrations greater than 0.01f/cc shall be submitted for TEM analysis.

ii. During the first five (5) days of RACS disturbance – A minimum of 25% of the samples collected from each RWA, inclusive of the downwind floating samples as described in 5.5.7(E)(2), shall be submitted for TEM analysis. The sample(s) selected for TEM analysis shall have the highest PCM result(s) based on fiber concentration. If all PCM results are Below Detectable Limit (BDL) for fiber concentration, then ~~the sample(s) selected for TEM analysis shall be determined by highest fiber count. If all samples have no fiber counts (i.e. zero fibers counted, not a “below detection limit” fiber concentration) then~~ no TEM analysis is required.

Comment [Denver49]: R results that are entirely below detection using PCM indicate successful implementation of engineering controls.

iii. After five (5) days of RACS disturbance with ~~no fewer than three (3)~~ asbestos detections by TEM analysis, the frequency of analysis by TEM, on the highest 25% of PCM results(s), may be reduced to once every five (5) working days, or portions thereof, using the same selection criteria as in paragraphs [i](#) and [ii](#) above. The samples submitted for TEM analysis during the period of reduced frequency TEM analysis shall be either the first occurrence of: 1) high winds exceeding wind shut down criteria, or 2) visible emissions. In the absence of high wind events or visible emissions the selected day for TEM analysis may be random, as determined by the AMS.

Comment [Denver50]: R remove the single-fiber trigger.

iv. If there are ~~any~~ three (3) or more asbestos detections during the random once every five days analysis by TEM, then TEM analysis shall be conducted for the next three (3) consecutive work days, or portions thereof, using the same procedures as in paragraph i above. If there are no additional asbestos detections during the next three (3) consecutive working days with samples submitted for TEM analysis, then the frequency of TEM analysis may return to random once every five (5) working days. If site conditions, ~~friability of the materials being managed,~~ or work practices materially change, or friability of the materials being managed changes, then the initial 5 days of TEM analysis shall restart using the provisions set forth in 5.5.7(E)(1)(e).

Comment [A52]: Issue: enforceability – strict liability for any change vs. material changes

(f) Detection responses - For each detection of asbestos by TEM analysis, the following shall be conducted:

i. Notify the Department project manager by phone or email, on the same calendar day as receipt of verbal or written results (whichever comes first) from the laboratory.

- 1126
- 1127 ii. Evaluate site conditions and engineering controls for each detection, and
- 1128 immediately implement any identified engineering control revisions
- 1129 necessary ~~in order to prevent to minimize~~ alternative: with the goal of
- 1130 preventing future detections of asbestos fibers.

Comment [A53]: Issue:
standard of care - prevent vs.
minimize

1131

1132 (g) If there are three (3) TEM detections on consecutive analysis events or ten

1133 (10) detections for a single project, consultation with the Department is

1134 required to determine whether the standard requirements of Section 5.5.7 are

1135 being implemented appropriately and whether submission of an Emission

1136 Control Plan (ECP) to the Department project manager is required. If

1137 required, the ECP shall be submitted within 48 hours after the asbestos

1138 detection event and shall contain:

Comment [Denver54]: D
etection of a single fiber
should require notification
and evaluation but not
submission of an ECP.
Instead, ECP should be
required only when the
number of detections
indicates a greater likelihood
that the engineering controls
are not minimizing releases.

- 1140 iii. Submit an Emission Control Plan (ECP) to the Department project
- 1141 manager for each detection (days with multiple detections can be
- 1142 addressed by a single ECP). The ECP shall be submitted within 48 hours
- 1143 from the asbestos detection event and shall contain:

- 1144
- 1145 1. The date of the detection.
- 1146
- 1147 2. A written description of sample details (sample ID, number of
- 1148 structures detected, type of asbestos detected, PCM analytical result)
- 1149 and any potential cause of the release. Include a description of site
- 1150 activity (engineering controls being employed, equipment being used,
- 1151 size of excavation/soil disturbing activity, and types of materials
- 1152 encountered/disturbed, etc.) and CABI observations at the work area
- 1153 before and during the presumed time of release.
- 1154
- 1155 3. Include a diagram or write up of all air sample positions clearly
- 1156 indicating which sample received the TEM detection. Indicate, through
- 1157 illustration or description, prevailing wind direction and average wind
- 1158 speeds for the detection event; include any wind speed shutdowns for
- 1159 the date of detection. If applicable, indicate downwind floater air
- 1160 sample relocation times and new positions through illustration or
- 1161 description ~~downwind floater air sample relocation times and new~~
- 1162 ~~positions.~~
- 1163
- 1164 4. Attach ~~IL~~ laboratory reports confirming the type and amount of fibers
- 1165 detected by TEM analysis.

Comment [A55]: Issue:
applicability – encounter vs.
disturb

Comment [Denver56]: D
rafting suggestion: remove
“etc.”

Comment [Denver57]: D
rafting suggestion

- 1166
- 1167 5. Documentation demonstrating possible additional sources of asbestos
- 1168 fibers;
- 1169

Comment [Denver58]: D
rafting suggestion

1170 ~~65. Include a~~ any other pertinent information that will additionally describe
1171 the release and/or will assist in the ~~prevention~~ minimization of future
1172 releases from the RWA.

Comment [A59]: Issue:
Standard of care - prevent vs.
minimize

1174 ~~76. Provide a~~ written description of actions taken and any other proposed
1175 actions ~~in order to prevent to minimize~~ alternative: with the goal of
1176 preventing future releases from the RWA.

Comment [A60]: Issue:
Standard of care - prevent vs.
minimize

1177
1178 ~~(g) If there are three (3) TEM detections on consecutive analysis events or ten~~
1179 ~~(10) detections for a single project, consultation with the Department is~~
1180 ~~required to determine if the standard requirements of Section 5.5.7 are being~~
1181 ~~implemented appropriately and whether;~~

Comment [Denver61]: D
rafting suggestion. Delete (g)
because these items will
already be considered as part
of the ECP and are redundant.

1182
1183 ~~i. Changes in the standard requirements of Section 5.5.7 are likely to~~
1184 ~~prevent future releases; or~~

Comment [A62]: Issue:
Standard of care - prevent vs.
minimize

1185
1186 ~~ii. Changes in the standard requirements of Section 5.5.7 are not likely to~~
1187 ~~prevent future releases and a PSRMP is necessary per Section~~
1188 ~~5.5.5(A)(2); or~~

1189
1190 ~~iii. If the owner/operator believes fibers are coming from offsite and are not~~
1191 ~~under the control of the owner/operator, then, in addition to the~~
1192 ~~information provided in the ECP, documentation shall be provided~~
1193 ~~demonstrating possible additional sources of asbestos fibers; or~~

1194
1195 ~~iv. Consultation with the Department is required to determine whether~~
1196 ~~additional engineering controls for structures within the adjacent receptor~~
1197 ~~zone are appropriate.~~

1198
1199 **(2) Additional requirement for projects disturbing RACS containing friable**

1200 **ACM.** Collect two additional downwind floating samples for mechanical
1201 disturbance of RACS containing friable ACM. The samplers shall be moved
1202 based on prevailing wind direction and adjacent receptors. For example, if
1203 adjacent receptors are present on only one side of the RWA, one sample location
1204 should be maintained between the RWA and the adjacent receptor.

1205
1206 **(F) WORK PRACTICES TO BE FOLLOWED DURING RACS DISTURBANCE**

1207
1208 **(1) Work practice requirements applicable to all management of RACS:**

1209
1210 **(a) ~~Prevent~~ Minimize visible emissions from leaving the RWA by:**

Comment [A63]: Issue:
Standard of care - prevent vs.
minimize

1211
1212 **i. Excavating in lifts not to exceed the extent of wetting; or**
1213

- 1214 ii. Conducting continuous wetting while mixing dry materials at the point of
1215 RACS disturbance to ensure all materials are adequately wet prior to
1216 removal from the excavation.
1217
1218 iii. Instances of visible emissions leaving the RWA shall be documented and
1219 addressed by changing or increasing controls (e.g. more effective wetting,
1220 reduced speed of excavation).
1221
1222 (b) RACS on exposed excavation faces that will be disturbed and/or managed
1223 during the project shall either be kept adequately wet (in accordance with
1224 Section 5.5.7(C)), or be stabilized using any of the following ~~in order to~~
1225 ~~prevent to minimize~~ visible emissions from leaving the RWA:
1226
1227 i. Polyethylene sheeting or geotechnical fabric with daily inspection, and
1228 inspection after storm events immediately or within 12 hours, and
1229 repair/replace sheeting as necessary to maintain stabilization; or
1230
1231 ii. Chemical stabilizer demonstrated to be effective in the stabilization of
1232 RACS (e.g. magnesium chloride) with weekly inspection, and inspection
1233 after storm events immediately or within 1 calendar day, and re-application
1234 of chemical stabilizer as necessary to maintain stabilization; or
1235
1236 iii. Minimum of 3 inches of soil appropriate for unrestricted use.
1237
1238 (c) Stormwater shall be managed in accordance with the Water Quality Control
1239 Commission's stormwater regulations (5 CCR 1002-61), which include
1240 specific stormwater permitting and management requirements for
1241 construction sites. The Water Quality Control Division should be contacted to
1242 determine the specific requirements for each project. Stormwater shall be
1243 managed in a manner that minimizes run on and runoff from RACS.
1244 Stormwater that comes into contact with RACS shall be treated as asbestos
1245 contaminated water in accordance with Section 5.5.7(J)(4), and other
1246 material(s) impacted by asbestos contaminated stormwater shall be managed
1247 as RACS in accordance with Section 5.5.7(J)(3).
1248
1249 (2) Work Practice requirements applicable to the management of RACS using hand
1250 methods:
1251
1252 a. Wet and remove the RACS and 6 inches, in all directions, of surrounding
1253 soil or other material from the last occurrence of visible ACM; and,
1254
1255 b. A CABI shall confirm that the ~~visual~~ visible extent of ACM and surrounding
1256 soil, or other material, has been removed (or extent of excavation has
1257 been reached). If RACS remains, it shall be managed for stabilization or

Comment [A64]: Issue:
Standard of care - prevent vs.
minimize

Comment [A65]: Drafting
suggestion to refer to ACM
that has been seen in exercise
of reasonable care (by
reliance on definition of
"visible" as proposed by
Denver).

future removal. If there is no documented evidence of non-visible RACS at the site, then a visual clearance shall be sufficient to determine the removal of RACS. If there is documented evidence of non-visible RACS at the site, sampling is required to confirm the removal of RACS. After the removal of the additional six (6) inches, and in the absence of any debris, a QPM may make the determination that RACS has been removed; and,

- c. For the purpose of disposal, containerize non-friable asbestos-containing materials and associated soil and/or other matrix material ~~using a single layer of 6 mil leak tight packaging,~~ or containerize friable asbestos-containing materials and associated soil and/or other matrix material ~~using a double layer of 6 mil leak tight packaging. Rigid leak tight containers are also acceptable as packaging for asbestos waste. Dispose and dispose of~~ materials properly in accordance with ~~5.5.8(A) 5.5.2 or 5.5.3 as applicable.~~
- d. In-situ sub-surface hand removal of a single location RACS pocket shall consist of:
- Removal of the pocket of ~~RACS and associated soil or other material,~~ plus removal of an additional 6 inches in the direction of planned disturbance; and
 - CABI confirmation that the ~~visual visible~~ extent of ~~RACS ACM~~ and surrounding soil and/or other matrix material has been removed. If RACS remains, it shall be managed for stabilization or future removal. If there is no documented evidence of non-visible RACS in the project area, then a visual clearance shall be sufficient to determine the removal of RACS. If there is documented evidence of non-visible RACS in the project area, sampling is required to confirm the removal of RACS; and
 - For the purpose of disposal, containerize non-friable asbestos-containing materials and associated soil and/or other matrix material ~~using a single 6 mil leak tight bag,~~ or containerize friable asbestos-containing materials and associated soil and/or other matrix material ~~using a double 6 mil leak tight bag. Dispose and dispose of~~ materials properly in accordance with 5.5.8(A)

(3) Work practice requirements applicable to management of RACS using mechanical methods:

- a. For surface occurrence of RACS - Wet and remove all RACS and a minimum of 6 inches of soil, and/or other matrix material, in all directions from the last

Comment [Denver66]: Issue: Packaging and transport; NESHAPS does not require leak tight packaging. 5.2 require does not require any particular type of packaging for nonfriable.

Comment [Denver67]: The Commission is free to establish separate packaging/disposal requirements for this type of soil containing asbestos. By operation of 5.1.1(B), this section 5.5 will control.

Comment [Denver68]: NESHAP is not applicable. Commission has discretion to adopt packaging requirements it determines to be sufficiently protective, recognizing that this is large volume of soil containing small amounts of asbestos.

Comment [A69]: Drafting suggestion. As used here, RACS is already defined (at p. 4, line 164) to include the associated 6" of surrounding soil/material.

Comment [A70]: Drafting suggestion – this subpara should be parallel with b, above, at line 1255.

Comment [A71]: Issue: Packaging and transport; see comments A67-A69

1301 occurrence of visible ACM, with CABI confirmation that the ~~visual~~ visible
1302 extent of RACS has been removed; and/or

Comment [Denver72]: Issues: Applicability – visible;
enforceability: strict liability
vs standard of care

1304 b. For subsurface occurrence of RACS - Wet and remove all RACS and a
1305 minimum of three (3) linear feet of soil or other matrix material, in the
1306 direction(s) of planned excavation, with CABI confirmation that the ~~visual~~
1307 visible extent of RACS has been removed. If there is no documented
1308 evidence of non-visible RACS at the site, then a visual clearance shall be
1309 sufficient to determine the removal of RACS. If there is documented evidence
1310 of non-visible RACS at the site, sampling is required to confirm the removal of
1311 RACS. After the removal of the additional three (3) linear feet, and in the
1312 absence of any debris, a QPM may make the determination that RACS has
1313 been removed; and

Comment [Denver73]: Issues: Applicability – visible;
enforceability: strict liability
vs standard of care

1315 c. If RACS remains in the RWA, it shall be managed for stabilization, per
1316 5.5.7(K), or future removal.

1318 d. In lieu of stabilization or full removal, sampling may be performed per
1319 Appendix 5A to demonstrate that the material is not RACS.

1321 e. Package and dispose of RACS in accordance with Section 5.5.8.

1323 (4) Soil or other matrix material that remains after removal of RACS in accordance
1324 with 5.5.7(F), 5.5.7(H)(1)(c)(i), or an approved plan, is not considered RACS, is
1325 not subject to Section 5.5, and may be appropriate for unrestricted use, onsite or
1326 offsite, as long as it does not contain any other regulated material.

1328 (G) LOADING AND PLACEMENT OF RACS

1330 (1) Requirements for the loading of RACS:

1332 (a) Protect clean surfaces (including loading surface and truck or disposal
1333 container surfaces that may come in contact with RACS) by covering or
1334 decontamination of surfaces prior to transport or removal of the truck or
1335 disposal container from the RWA and/or loading zone.

1337 (b) Spill prevention shall consist of:

1339 i. Minimization of spillage by not overfilling the excavator or loader bucket
1340 and returning the bucket to a closed position prior to moving from the
1341 loading point; and

1343 ii. Replacement of protective coverings when worn or ~~damaged~~ in order to
1344 prevent breaches; and

Comment [A74]: Drafting
suggestion to make the
requirement clear (as
distinguished from the
rationale for the requirement
which can be moved to the
SBP if desired).

1345
1346 iii. Control of runoff ~~in order to prevent cross contamination from water~~
1347 ~~containing asbestos~~; and

Comment [A75]: Drafting suggestion to make the requirement clear (as distinguished from the reason for the requirement).

1348
1349 iv. Mitigation of spills of RACS in accordance with 5.5.7(J).

1350
1351 (c) During the process of loading the container, the equipment operator shall
1352 lower the bucket as close as possible to the interior of the container before
1353 dumping, and dump the load slowly to allow adequate misting ~~and in order to~~
1354 ~~prevent to minimize~~ emissions.

Comment [A76]: Issue: standard of care – prevent vs. minimize

1355
1356 (2) Requirements for the transportation of RACS:

1357
1358 (a) Onsite transportation of RACS between the RWA and an onsite area of
1359 staging, stockpiling, storage, disposal or reuse shall comply with the following:

1360
1361 i. The packaging requirements for RACS set forth in Section 5.5.8(A) of
1362 these Regulations are not applicable; however, the decontamination
1363 requirements of Section 5.5.7(I) shall be followed at the end of disposal
1364 operations, or before disposal equipment is removed from the site; and

1365
1366 ii. Driving speeds shall not exceed 12 miles per hour or RACS shall be
1367 covered during transport; and

1368
1369 iii. For transportation between the RWA and a non-contiguous onsite staging,
1370 stockpiling, storage, disposal, or reuse area:

1371 1. Transportation equipment tires shall kept off RACS; or

1372
1373 2. RACS that is driven upon shall be kept adequately wet ~~in order to~~
1374 ~~prevent visible emissions~~ and all equipment surfaces that have come
1375 into contact with RACS shall be decontaminated per 5.5.7(I) before
1376 leaving the RWA; or

Comment [A77]: Drafting suggestion to make the requirement clear (as distinguished from the reason for the requirement). The prevent/minimize concept is embodied in the definition of “adequately wet” and need not be repeated here.

1377
1378 3. The haul road shall be managed as RACS for stabilization, per
1379 5.5.7(F)(1), and future removal of a minimum of 3 inches of soil, or
1380 other matrix material. If the road is constructed of a durable surface
1381 such as concrete or asphalt, the surface shall be decontaminated in
1382 accordance with 5.5.7(I)(1)(b) using wet methods, followed by CABI
1383 inspection verifying that all soil and debris has been removed from the
1384 surface. Rinsate/runoff shall be collected and filtrated to less than 5
1385 microns (or applicable local requirements) and discharged to a sanitary
1386 sewer or other Department-approved disposal facility or re-applied to
1387 RACS that will be managed under these regulations.
1388

(H) ONSITE STAGING, STOCKPILING, AND STORAGE OF RACS

(1) Staging, as defined in Section 1.2 of these regulations, is the accumulation and temporary storage of RACS in the RWA for 12 hours or less. The following requirements shall apply to the staging of RACS:

(a) Staged RACS shall remain adequately wet,

(b) Staging of RACS shall be on 6 mil, or greater, polyethylene sheeting or shall include removal, and management as RACS, of a minimum of 3 inches of material, from below the staging pile/area prior to demobilization; with visual or measured confirmation of removal. If ~~poly~~polyethylene sheeting is placed on top of a durable surface such as concrete or asphalt, the surface must be decontaminated using wet methods, followed by CABI inspection verifying that all soil and debris has been removed from the surface. Rinsate/runoff shall be collected and filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations.

(c) Staging of clean material with incidental discovery of RACS shall be managed as follows:

- i. If a CABI was continually inspecting the material during generation, remove the piece of ACM and one foot of material in all directions, with CABI confirmation that the visual extent of RACS has been removed. If more than one piece of ACM, or a pocket of ACM is discovered, remove the pocket of ACM plus one foot of material in all directions, with CABI confirmation that the visual extent of RACS has been removed. Material that remains after removal of RACS, and CABI visual confirmation, is not ~~considered~~ RACS, is not subject to Section 5.5, and may be appropriate for unrestricted reuse, onsite or offsite, as long as it does not contain any other regulated material.
- ii. If a CABI was not continually inspecting the material during generation, an intrusive inspection of the pile shall be conducted to determine the extent of RACS contamination, followed by the removal of the visual extent of contamination plus removal of one foot of material in all directions. Alternatively, the entire pile, plus 3 inches of material below the pile, shall be removed and managed as RACS. If the pile was placed on top a durable surface such as concrete or asphalt, the surface shall be decontaminated using wet methods, followed by CABI inspection verifying that all soil and debris has been removed from the surface. Rinsate/runoff shall be collected and filtrated to less than 5 microns (or applicable local

Comment [A78]: Drafting suggestion for sake of clarity. Not only is it not "considered" RACS, it simply is not RACS.

requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations.

(2) Stockpiling, as defined in Section 1.2 of these regulations, is the accumulation and storage of RACS that will exist for more than 12 hours, up to and including 10 calendar days. The following requirements shall apply to stockpiled RACS:

- (a) Stockpiled RACS shall be placed on a minimum of 6 mil polyethylene sheeting or shall include removal, and management as RACS, of a minimum of 3 inches of soil, or other matrix material, from under the entire area of RACS stockpiling after stockpile removal. If the stockpile was placed on top of a durable surface such as concrete or asphalt, the surface must be decontaminated using wet methods, followed by CABI inspection verifying that all soil and debris has been removed from the surface. Rinsate/runoff shall be collected and filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations.
- (b) RACS shall be adequately wet during disturbance.
- (c) Stockpiled RACS shall be controlled per 5.5.7(A)
- (d) Stockpiled RACS shall be stabilized by:
 - i. Polyethylene sheeting or geotechnical fabric with daily inspection, and inspection after storm events, and repair/replace sheeting as necessary to maintain stabilization; or
 - ii. Chemical stabilizer demonstrated to be effective in the stabilization of RACS (e.g. magnesium chloride) with weekly inspection, and inspection after storm events, and re-application of chemical stabilizer as necessary to maintain stabilization; or
 - iii. Minimum of 3 inches of soil appropriate for unrestricted use.
- (e) The maximum duration that RACS may be stockpiled shall not exceed 10 calendar days
- (f) For stockpile areas that are non-contiguous with the RWA, transportation of RACS shall be conducted in accordance with the following:
 - i. Transportation equipment tires shall kept off RACS; or

- 1477
- 1478 ii. The tires shall be decontaminated per 5.5.7(l) before leaving the RWA; or
- 1479
- 1480 iii. The haul road shall be managed as RACS for stabilization, per
- 1481 5.5.7(H)(2)(d), and future removal of a minimum of 3 inches of soil, or
- 1482 other matrix material. If the road is constructed of a durable surface such
- 1483 as concrete or asphalt, the surface shall be decontaminated using wet
- 1484 methods, followed by CABI inspection verifying that all soil and debris has
- 1485 been removed from the surface. Rinsate/runoff shall be collected and
- 1486 filtrated to less than 5 microns (or applicable local requirements) and
- 1487 discharged to a sanitary sewer or other Department-approved disposal
- 1488 facility or re-applied to RACS that will be managed under these
- 1489 regulations.
- 1490
- 1491 (g) For a stockpile that was previously thought to be free of RACS, but where
- 1492 RACS is subsequently identified, ~~follow~~ the procedure outlined in 5.5.7
- 1493 (H)(1)(c) shall be followed.
- 1494
- 1495 (3) Storage of RACS exceeding ten calendar days shall require the submission of a
- 1496 RACS Storage Plan. Storage of RACS shall not commence prior to approval of
- 1497 the RACS Storage Plan by the Department's Hazardous Materials and Waste
- 1498 Management Division. The RACS Storage Plan shall include:
- 1499
- 1500 (a) Approval of storage with signature from the property owner; and
- 1501
- 1502 (b) Volume of RACS intended for storage; and
- 1503
- 1504 (c) Liner design or provisions for removal of a minimum of 3 inches of underlying
- 1505 material; and
- 1506
- 1507 (d) Storm water design including protections for run-on and run-off; and
- 1508
- 1509 (e) Cover design or use of an equivalent durable stabilizer; and
- 1510
- 1511 (f) Access control and signage; and
- 1512
- 1513 (g) Storage timeframe (shall not exceed 6 months unless an extended storage
- 1514 timeframe is approved by the Department or the duration of the project,
- 1515 whichever is shorter); and
- 1516
- 1517 (h) Inspection and maintenance schedule; and
- 1518
- 1519 (i) Closure and removal requirements; and
- 1520

- (j) Documentation and reporting; and
- (k) Certification by an independent, qualified, and registered Professional Engineer.
- (4) Temporary sub-surface storage of RACS in areas of future planned RACS removal shall not exceed 6 months and shall comply with the following:
- (a) RACS may only be placed within the Area of Contamination (AOC) that it was originally removed from.
- (b) Placement of RACS utilizing standard RACS management requirements in accordance with the standard requirements of Section 5.5.7, an approved PSRMP, or an approved SOP.
- (c) Cover RACS in accordance with the requirements of Section 5.5.7(K) ~~or 5.5.7(F)(1)(b).~~
- (d) RACS not removed within 6 months, or the duration of the project, whichever is shorter (unless an extended storage timeframe is approved by the Department), shall be considered disposal in accordance with Section 5.5.8(A), or reuse within an area of contamination and ~~will~~ may require an environmental covenant ~~in accordance with 5.5.8(B)(1).~~
- (5) Offsite staging, stockpiling, and storage of RACS are allowed as long as it complies with the disposition requirements of Section 5.5.8.

(I) DECONTAMINATION

(1) Requirements applicable to all projects subject to Section 5.5:

(a) Personnel Decontamination:

- i. Remove booties and/or gloves before exiting RWA and dispose as asbestos contaminated waste; or
- ii. If not using disposable PPE, decontaminate boots in a boot wash station, remove gloves after exiting the boot wash station, and dispose of gloves as asbestos contaminated waste. Rinsate from the boot wash station shall be collected, filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility, or re-applied to RACS that will be managed under these regulations.

Comment [A79]: Drafting suggestion. The Division's proposal would require permanent covers (as in 5.5.7(K) for temporary sub-surface storage. This approach is unduly burdensome and costly. 5.5.7(F)(1)(b) (at p. 29) for temporary storage requires cover with polyethylene sheeting or geotechnical fabric with inspections; chemical stabilizer; 3" soil. 5.5.7(K) (at p. 39) establishes more extensive permanent cover requirements (geofabric + 18" fill + vegetation; geofabric + 6" fill + concrete; or for vertical faces - geofabric + 6" fill;

Comment [Denver80]: D rafting suggestion. Section 5.5.8(B) does not require an environmental covenant.

(b) Decontamination of Equipment or Surfaces that have come into Contact with RACS

i. For equipment that comes into contact with RACS:

1. Wet decontamination on a decontamination pad (minimum 10 mil poly or other durable non-permeable barrier) followed by CABI inspection and verification of equipment decontamination before it leaves the decontamination area. All decontamination liquids and solids shall be contained, and run-on and run-off shall be prevented. Rinsate/runoff shall be collected, filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations; For breaches in the decontamination pad where RACS or water contaminated with asbestos may have impacted the material below the decontamination pad, implement the provisions of section 5.5.7(J):

~~**Note:** For breaches in the decontamination pad where RACS or water contaminated with asbestos may have impacted the material below the decontamination pad, implement the provisions of section 5.5.7(J):~~

and/or

2. Decontamination using HEPA vacuums followed by CABI inspection and verification of equipment decontamination before it leaves the decontamination area.

(c) Protection of Clean Equipment and Surfaces:

- i. Keep all equipment off of RACS; or
- ii. Protect clean surfaces from coming in contact with RACS by covering equipment surfaces or RACS surfaces with polyethylene sheeting or equivalent durable impermeable covering. For onsite movement of excavation equipment between RWAs, where only the excavator bucket has come in contact with RACS, the bucket shall be wrapped in polyethylene sheeting (minimum 6 mil) prior to movement. Protective coverings shall be cleaned, repaired, or replaced as necessary. If protective coverings are breached and RACS or asbestos contaminated water comes into contact with underlying material, the provisions of

Comment [A81]: Drafting suggestion: the conjunction must be "and" or "or" in order to understand what the requirement is. Alternatively, a statement of when either/both requirements applied would be useful.

section 5.5.7(J) shall be followed. Coverings that have come in contact with RACS shall be disposed as asbestos contaminated waste.

(2) Additional Requirements for Projects Disturbing RACS Containing Friable ACM:

- (a) Remove disposable impermeable suits or equivalent coveralls before exiting RWA and dispose as asbestos contaminated waste, or
- (b) After removal of suits or coveralls, conduct full wet decontamination prior to exiting RWA with collection of rinsate and filtration to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or reapplied to RACS that will be managed under this section 5.5. Re-application of decontamination shower water is prohibited.

Comment [A82]: Drafting suggestion – for consistency with other provisions, such as: 5.5.7(G)(2)(a)(iii)(3) at p. 32.

(J) RACS SPILL RESPONSE

- (1) Areas where RACS is spilled are RWAs until clean up is completed.
- (2) Spilled material shall be cleaned up immediately and not allowed to dry out or accumulate on any surface. The Department's Hazardous Materials and Waste Management Division shall be notified, through the spill reporting hotline, in the event that spills of RACS cannot be cleaned up within 24 hours of spill identification.
- (3) Where there are breaches in ground coverings that have the potential to allow RACS or water contaminated with asbestos to impact the material below the covering, a minimum of 3 inches of soil, or other matrix material, shall be removed from beneath the breached ground coverings. Visual or measured (e.g. survey) confirmation that 3 inches of soil and/or other matrix material from beneath the breached covering has been removed shall be conducted. If ground coverings are placed on top of a durable surface such as concrete or asphalt, the surface shall be decontaminated using wet methods, followed by CABI inspection that all soil and debris has been removed from the surface.
- (4) Rinsate, runoff, or any other water that has come into contact with RACS shall be considered to be asbestos contaminated water and shall be collected and filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations.
- (5) Surfaces that are contacted by asbestos contaminated water shall be managed as RACS as per 5.5.7(J)(3) or permanently stabilized as per 5.5.7(K).

Comment [A83]: Drafting suggestion – for consistency with other provisions, such as: 5.5.7(G)(2)(a)(iii)(3) at p. 32.

- (6) If work practices in an RWA are causing an ongoing spill outside the RWA, the work practices shall cease or be modified to prevent additional releases.

(K) REQUIREMENTS FOR EXPOSED RACS REMAINING IN PLACE

- (1) Any remaining RACS that has been exposed by the soil disturbing activity, but is not disturbed, such as an excavation side-wall or bottom shall be covered or stabilized using one of the following:

- (a) Cover RACS with geofabric, followed by 18 inches of fill suitable for unrestricted use, and vegetation; or
- (b) Cover RACS with geofabric, followed by 6 inches of fill suitable for unrestricted use, and concrete or asphalt; or
- (c) Cover RACS with geofabric, followed by fill suitable for unrestricted use to grade or six inches, whichever is greater, for vertical excavation faces or trenches; or
- (d) Alternate cover designs as approved by the Department.

(L) DOCUMENTATION

- (1) The documents listed below shall be maintained during a project and available for Department review upon request. However, this documentation need not be submitted to the Department unless requested. CABI and AMS notes may be collected by one individual if they possess both certifications; however, if no AMS is onsite ~~it may be necessary for~~ the CABI ~~shall to~~ provide items listed in the AMS notes section (e.g. wind monitoring and shutdown events). CABI and AMS notes may be taken by a scribe, but shall be reviewed and approved by the CABI or AMS for whom the notes are being taken. Other appropriate personnel may also provide the following documentation.

- (a) CABI/QPM Notes shall include documentation of:

- i. Site description including location; and
- ii. Descriptions of site activities; and
- iii. Descriptions of equipment in use; and
- iv. Descriptions of hand removals (including locations); and
- v. Descriptions of types of debris ~~encountered~~ disturbed; and
- vi. Descriptions of suspect material ~~encountered~~ disturbed; and
- vii. Friability of ACM ~~encountered~~ disturbed (~~as~~ As determined by a CABI; and
- viii. Sampling, if ~~conducted~~ (~~All sampling shall be conducted by a CABI~~); and
- ix. Decontamination visual clearances; and
- x. Excavation visual clearances; and

Comment [A84]: Drafting suggestion: Record keeping for all types debris/suspect material/ACM encountered is unduly burdensome and costly.

Comment [A85]: Drafting suggestion – it is inappropriate to establish requirement that CABI must do the sampling in this record-keeping portion of the regulation. Move to a substantive section or Appendix A.

- xi. Spill response activities; and
- xii. Observations of visible emissions and responses; and
- xiii. Observations non-earthen material or the appearance of fill; and
- xiv. Observations of other indicators of impact to soils.

(b) AMS notes shall include documentation of:

- i. Wind speed measurements; and
- ii. Prevailing wind direction(s); and
- iii. Wind shut down event(s); and
- iv. Initial air sample locations; and
- v. Air sample relocation notes; and
- vi. Observations of visible emissions and responses; and
- vii. Notes pertaining to sample malfunctions (pump faults, overloading, etc.); and
- viii. Instances of samples being compromised (samples knocked over, sample filters being sprayed with water, samples physically impacted by equipment, etc.); and
- ix. Air sample data (flow rates, time of sampling, volumes, calibration method, etc.).

(c) General documentation shall include:

- i. Disposal records; and
- ii. Analytical reports including chain of custody forms; and
- iii. Evaluations of any samples with a “cannot be read” analysis result and the notifications of these events to the Department; and,
- iv. Location of known remaining RACS; and
- v. Creation and removal dates for, and locations of, staged, stockpiled, and/or stored RACS, and
- vi. Stockpile and staging pile inspection logs and documentation of weather events requiring inspection, and
- vii. Logs of all site personnel with access to the RWA, and
- viii. Certification records for all CABIs and AMSs utilized on the project, and
- ix. Records for training conducted in accordance 5.5.3(C) and 5.5.3(D)
- x. Records demonstrating the QPM(s) meet the training and experience requirements set forth in Section 5.5.3(E).

5.5.8 PACKAGING AND DISPOSITION OF REGULATED ASBESTOS CONTAMINATED SOIL

(A) Disposal of RACS

- (1) RACS containing one percent (~~1%~~), ~~or one pound~~, or greater of friable ACM (as determined in the field by a CABI) by volume per load or container, based on

Comment [A86]: Issue: Applicability – CERCLA RQ. The Division’s basis for including the 1-pound limitation is the CERCLA reportable quantity requirement for landfills; it is not applicable and should be stricken.

visual estimation through continuous inspection or other Department-approved quantifiable means of measurement, shall be packaged in a leak tight container and disposed as friable asbestos waste, in accordance with Section 5.3 of these regulations. Alternatively, ~~no~~ friable ACM determination by a CABI is not required if the disposal load is assumed to be RACS containing 1% or greater of friable ACM and is packaged and disposed of in accordance with Section 5.3 of these regulations. Documentation shall accompany each load of RACS removed from the site stating that soil originating from this site shall not be used as daily cover or reused offsite.

(2) For RACS containing

(a) Less than one percent (~~1%~~), ~~and less than one pound~~, of friable ACM (as determined in the field by a CABI) by volume, per load or container, based on visual estimation through continuous inspection, or other Department-approved quantifiable means of measurement, shall be ~~packaged in a leak tight container and~~ disposed in a manner similar to non-friable asbestos waste, as described in Section 5.2 of these regulations. Documentation must accompany each load of RACS removed from the site stating that soil originating from this site shall not be used as daily cover or reused offsite.

(b) ~~Except as provided in subparagraph (a) of this subsection (2), only~~ Only visible non-friable ACM (as determined in the field by a CABI) that has not been rendered friable, or RACS that contains no visible ACM, shall be ~~packaged in a leak tight container and~~ disposed of as non-friable asbestos in accordance with Section 5.2 of this Part 5. Documentation shall accompany each load of RACS removed from the site stating that soil originating from this site shall not be used as daily cover or reused offsite.

(c) A total volume of debris that is less than 1% of the disposal load, based on visual estimation through continuous inspection, and the debris is all assumed to be RACS, then a CABI is not required to make a friable ACM determination.

(3) A Design and Operations (D&O) plan shall be submitted to, and approved by, the Department for onsite disposal of RACS outside of the AOC, in accordance with the Colorado Solid Wastes Disposal Sites and Facilities Act (C.R.S. 30-20, Part 1) and these regulations. The packaging requirements set forth above in 5.5.8(A)(1-2) are not required for onsite disposal, but the requirements of Section 5.5.5(A)(2) (e) are applicable. An environmental covenant, ~~in accordance with 25-15-320, C.R.S., is may be statutorily~~ required for onsite RACS disposal, and a Certificate of Designation shall be required, in accordance with Section 1.6 of these regulations, unless exempt under Section 1.4.

Comment [A87]: Issue: Packaging – The Commission has authority to modify the 5.2, 5.3 packaging/disposal requirements; by operation of 5.1.1, any conflict between those sections and 5.5, 5.5 shall control.

Comment [A88]: Issue: Applicability – CERCLA RQ. The Division's basis for including the 1-pound limitation is the CERCLA reportable quantity requirement for landfills; it is not applicable and should be stricken.

Comment [A89]: Issue: Packaging and transport. The Commission is urged, as a matter of policy, to establish a 1% threshold for requiring leak tight packing of friable ACM. Note: Section 5.2 does not require leak tight packaging.

Comment [A90]: Drafting suggestion to conform with the change suggested in (2)(a).

Comment [A91]: 5.2 governing nonfriable asbestos does not require any particular packaging.

Comment [Denver92]: Drafting suggestion. As in the other sections, this regulation does not independently establish a covenant requirement, but notifies operators that separate statutory authority may require a covenant.

- (4) Owners/operators may propose pilot projects to demonstrate that alternative packaging for RACS, ~~that contains only non friable ACM and/or asbestos fibers in soil,~~ is ~~equivalently~~ protective ~~during the loading and transportation of RACS.~~ Pilot project work plans shall be submitted to the Department for review and approval prior to implementation. The alternative packaging must also be approved by the disposal facility accepting the waste.

Comment [A93]: Issue: packaging and transport

(B) Onsite reuse of RACS:

- (1) A plan for Reuse of RACS within the footprint of the AOC shall be submitted to the Department for review and approval and shall comply with 5.5.5(A)(2)(e), and the following cover requirements:

- (a) Cover RACS with geofabric, followed by 18 inches of fill suitable for unrestricted use, and vegetation; or
- (b) Cover RACS with geofabric, followed by 6 inches of fill suitable for unrestricted use, and concrete or asphalt; or
- (c) Cover RACS with geofabric, followed by fill suitable for unrestricted use to grade for vertical excavation faces or trenches; and
- (d) The final grades shall promote surface water run-off and minimize erosion, and shall have slopes no less than 5% (20:1) and no greater than 25% (4:1); or
- (e) Alternate cover designs as approved by the Department; and
- (f) An environmental ~~covenant, in accordance with 25-15-320, C.R.S.,~~ may be is statutorily required for onsite reuse of RACS.

Comment [A94]: Drafting suggestion: This edit clarifies that the statute itself establishes the covenant requirements, not this regulation. "in accordance with" is inappropriate because the statute provides for voluntarily entered covenants.

- (2) A plan for beneficial reuse of RACS outside the footprint of the AOC, in accordance with Section 8.6, shall be submitted to the Department for review and approval prior to its implementation. The plan shall include provisions for covering RACS ~~in order to prevent direct exposure,~~ and shall comply with the management requirements of Section 5.5.5(A)(2)(e). Additionally, the cover requirements outlined in Section 5.5.4(A)(3) shall be adhered to. An environmental ~~covenant in accordance with 25-15-320 C.R.S.,~~ may be is statutorily required for beneficial reuse of RACS.

Comment [A95]: Drafting suggestion: to make the requirement clear, as opposed to the reason for the requirement.

Comment [A96]: Drafting suggestion: This edit clarifies that the statute itself establishes the covenant requirements, not this regulation. "in accordance with" is inappropriate because the statute provides for voluntarily entered covenants.

- (C) Soil or other matrix material initially determined to be RACS may be demonstrated not to be RACS based on visual inspection, removal of all visible ACM, and sampling and analysis of the remaining material showing no detectable asbestos. Sampling and analysis shall be conducted in accordance with Appendix 5A. If there

Comment [A97]: Issue: applicability – visible vs non-visible ACM

1828 is no detectable asbestos, this material is no longer subject to Section 5.5 and may
1829 be appropriate for unrestricted use, onsite or offsite, as long as it does not contain
1830 any other regulated material.

1831

1832

1833 **5.5.9 FEES.**

1834

1835 The Department shall collect fees, from the owner, operator, or person conducting the
1836 soil disturbing activity, based on total documented costs, in accordance with Section 1.7

1837 **6) Appendix 5A (Sample Collection Protocols and Analytical Methodologies) is**
1838 **being added to Section 5 to read as follows:**
1839

1840
1841 **APPENDIX 5A**
1842 **SAMPLE COLLECTION PROTOCOLS AND ANALYTICAL METHODOLOGIES**

1843 **Purpose**

1844 The purpose of this appendix is to establish standard sample collection requirements
1845 and analytical methods and procedures for use in identifying and quantifying asbestos
1846 fibers in air, bulk material, and environmental media such as soil or ash.

1847 **Sample Collection Requirements**

1848 The following sample collection requirements shall be followed when collecting samples
1849 for the purpose of determining the applicability of Section 5.5, and when collecting
1850 samples necessary to comply with the requirements of Section 5.5. Remediation plans
1851 submitted in accordance with Section 5.5.6 shall include a site specific sampling and
1852 analysis plan that incorporates the sample collection methodologies and analytical
1853 procedures in this Appendix, or proposes alternatives, and includes site specific
1854 clearance criteria.

1855
1856 **Bulk Samples**

1857 Bulk samples shall be collected, in a manner sufficient to determine whether the
1858 material is asbestos-containing material (ACM) or not ACM, from each type of suspect
1859 ACM. Bulk samples shall be collected by a State of Colorado certified Asbestos
1860 Building Inspector. In the absence of bulk sample collection, any suspect ACMs must
1861 be assumed to be ACMs.

1862
1863 Bulk samples shall be collected by homogenous type based on color, pattern, texture,
1864 thickness, associated materials, or by other identifying characteristics. Additionally, the
1865 quantity and location of a suspect material shall be used to determine the number of
1866 bulk samples required to characterize the asbestos content of each homogeneous
1867 suspect material. For the purpose of determining that a homogeneous suspect material
1868 does not contain asbestos, a minimum of three bulk samples shall be collected from the
1869 homogeneous material unless there is insufficient material to constitute three samples.
1870 If one of the collected samples of a homogeneous bulk material is determined to be
1871 ACM, then the homogeneous material shall be considered ACM.

1873 Soil Samples

1874 Samples collected to determine asbestos content in soil shall be 10 point aliquot
1875 composite samples collected from a maximum area of 1,250 square feet (representing
1876 0-6 inches beyond the exposed surface) or a maximum volume of 40 cubic yards.
1877 Individual aliquots shall be approximately 1/10 of the entire sample volume. At each
1878 aliquot location approximately one tablespoon of soil shall be collected. The total
1879 volume of the 10 aliquots should equal roughly a half cup. The total collected sample
1880 volume should be greater than one quarter cup, but should not exceed one cup. Aliquot
1881 locations shall be randomly selected but shall be representative of the entire sample
1882 area or volume (to be inclusive of the interior of soil piles in addition to the surface).
1883 However, aliquots shall be co-located with any areas where friable ACM was formerly
1884 present. All samples collected to determine asbestos content shall be collected by a
1885 State of Colorado Certified Asbestos Building Inspector.

1886
1887 Sampling for clearance purposes of any exposed horizontal or vertical surface shall
1888 have the following additional requirements:

- 1889 A) The aliquots of a clearance sample shall not be collected until after the RACS,
1890 and the required amount of associated material, has been removed.
- 1891 B) A visual inspection shall be performed and passed (i.e., no visible ACM present)
1892 by a State of Colorado certified Asbestos Building Inspector prior to the collection
1893 of soil samples. Visual inspections shall include the following:
- 1894 a. The area to be cleared shall be designated before the visual inspection;
1895 and,
 - 1896 b. Former locations of friable materials shall be designated; and,
 - 1897 c. The surface being inspected shall be dry enough to allow identification of
1898 suspect ACM; and,
 - 1899 d. The visual inspection shall be conducted in adequate lighting; and,
 - 1900 e. The area to be cleared shall be free of visual impediments (e.g. snow
1901 cover, plastic sheeting, standing water, etc.); and,
 - 1902 f. At a minimum the area to be cleared shall be inspected in at least two
1903 perpendicular directions; and,
 - 1904 g. Single or multiple inspectors may be used to perform a visual clearance.
1905 However, a single inspector shall visually inspect no more than a five foot
1906 width with each pass [i.e. for a clearance area that is 25' x 50' a single
1907 inspector would be required to make at least 5 passes in one direction (25'
1908 length) and at least 10 passes in the other direction (50' length)]; and,
 - 1909 h. Detailed close examination of the area being cleared is required. The
1910 inspector(s) should use limited invasive inspection techniques, such as

1911 periodically sifting the surface being cleared and closely inspecting the
1912 disturbed area.
1913 C) If sidewalls with 6" or greater of vertical height are present, independent 10 point
1914 aliquot composite samples shall be collected from each of the sidewalls and the
1915 floor of the excavation.
1916

1917 Ash Samples

1918 Ash that contains, and/or is comingled with, suspect asbestos containing material
1919 and/or construction and demolition debris shall be considered to be RACS unless the
1920 ash is sampled, and analysis demonstrates that the ash is not RACS. Representative
1921 samples of each type of ash materials shall be sampled and analyzed in the same
1922 manner as soil (including area/volumetric limitations of sampling). Ash samples shall be
1923 collected by homogenous strata, location, content of other surrounding material, or
1924 other observations indicating heterogeneity of the ash present. All samples collected to
1925 determine asbestos content shall be collected by a State of Colorado Certified Asbestos
1926 Building Inspector. In the absence of suspect asbestos containing materials or
1927 construction and demolition debris, and in the absence of documented evidence of non-
1928 visible asbestos, ash material may be treated as non-RACS.
1929

1930 Cross Contamination Prevention

1931 All sample collection equipment shall be decontaminated in a manner sufficient to
1932 prevent cross contamination between individual samples or individual composite
1933 samples. Decontamination is not required between the collection of aliquots comprising
1934 a single composite sample.
1935

1936 Air Samples

1937 Air samples shall be collected by drawing air through 0.8-micron (μm), 25-millimeter
1938 (mm), mixed cellulose ester (MCE) filters, using an open-faced cowl extension oriented
1939 face down at an angle of 45°. Sample flow rate shall be between 0.5-10 liters per
1940 minute depending on the anticipated duration of sampling and the specified detection
1941 sensitivity. If the minimum air volume required by the method being utilized cannot be
1942 met, the AMS shall request that the laboratory prepare the sample using an indirect
1943 preparation method, for TEM presence/absence analysis. Air samples shall be
1944 collected at a height that is representative of the disturbance activity taking place.
1945 However, air samples shall be located at a height between 3' above the ground surface
1946 but not to exceed 20 feet above the ground surface. Air samples shall be collected by a
1947 State of Colorado trained and certified Air Monitoring Specialist.

Documentation

All of the following sampling and analytical documentation shall be maintained during a project and available for Department review upon request. This documentation need not be submitted to CDPHE unless requested or as required in a project specific plan.

1) Bulk, soil, and ash samples:

- a. Description of the material being sampled including friability
 - i. For samples collected for characterization purposes also include an estimate of the quantity of visible suspected RACS present
 - ii. For samples of ash, also include a brief description of the ash layer, and any associated identifiable debris
- b. Name of person collecting the sample(s)
- c. Date and time of sample collection
- d. Location of sample collection (A map, drawing, or diagram showing sample locations in relation to the work area and surrounding area)
- e. The boundary/limits that are represented by the collected sample
- f. Chain of custody documentation
- g. Laboratory analysis reports
- h. Log of characterized homogeneous bulk materials including material descriptions, photographic documentation, and asbestos content

2) Air samples:

- a. Name of person collecting the sample(s)
- b. Date and time(s) of sample collection
- c. Locations of air sample collection
- d. Any relocations of air samples
- e. A map, drawing, or diagram showing air sample locations (initial and relocations) in relation to the work area and the surrounding area
- f. Chain of custody documentation
- g. Laboratory analysis reports
- h. Explanation of any air sample malfunctions and any voided air samples
- i. Air sample data (flow rates, time of sampling, volumes, calibration method, etc.)
- j. Wind speed measurements
- k. Prevailing wind directions
- l. Wind shut down events
- m. Observations of visible emissions and responses

1986 **Analytical Requirements**

1987 The following analytical methods shall be used to evaluate the presence of asbestos
1988 and/or to determine asbestos content when analyzing samples for the purpose of
1989 determining the applicability of Section 5.5, and when analyzing samples collected in
1990 accordance with Section 5.5:

1991

1992 Bulk Samples

1993 Samples of suspect asbestos-containing material shall be analyzed by polarized light
1994 microscopy (PLM), according to United States Environmental Protection Agency
1995 (USEPA) Method EPA/600/R-93/116 or equivalent method, to determine if any asbestos
1996 fibers are present. If the asbestos content of a sample is estimated to be 1% asbestos
1997 or less, but greater than 0%, by a method other than point counting (such as visual
1998 estimation), the determination shall be repeated using the point counting technique with
1999 PLM. Alternatively, the material may be assumed to be ACM. Analysis shall be
2000 conducted by a National Voluntary Laboratory Accreditation Program (NVLAP)
2001 accredited laboratory.

2002

2003 Soil Samples and Ash Samples

2004 Prior to preparation of a soil or ash sample, bulk materials shall be separated from the
2005 soil or ash sample for independent analysis. Any bulk materials identified in a soil or
2006 ash sample that contain any amount of asbestos shall be reported as independent
2007 layers of the whole sample. The samples shall be adequately prepared (crushed and
2008 dried) to facilitate stereomicroscopic analysis by the laboratory. The goal of the
2009 preparation process should be to produce dried conglomerates of approximately one
2010 eighth inch (1/8") to one quarter inch (1/4") size. Rock and/or stone material does not
2011 need to be crushed (this process is not intended to be homogenization). Soil and ash
2012 samples shall be analyzed by PLM according to USEPA Method EPA/600/R-93/116 to
2013 determine if any asbestos fibers are present. Analysis shall be conducted by a National
2014 Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory. During the
2015 stereomicroscopic analysis (10X – 50X) of the soil/ash sample the analyst shall sift
2016 through the sample at a rate of approximately one tablespoon per minute. At the end of
2017 the stereomicroscopic analysis the sample shall be agitated or shaken as a final check
2018 for asbestos prior to the preparation of PLM grab mounts. At no time during the
2019 stereomicroscopic analysis shall a sub sample be collected. The entire sample shall be
2020 analyzed and the results reported. If no asbestos was identified by PLM after the initial
2021 stereomicroscopic examination, then three random grab mount preparations shall be
2022 analyzed by PLM to determine if the sample is none detected for asbestos content. If

any asbestos is found by the laboratory it shall be reported even in the absence of a second detection (i.e. there does not need to be a second detection to qualify a trace level of asbestos in the sample). Quantification of asbestos content shall be based on the entire sample volume, and be reported as such.

Air Samples

Air samples submitted for Phase Contrast Microscopy (PCM) shall be analyzed according to NIOSH Method 7400 by a laboratory showing successful participation in the American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program or individual(s) certified through the AIHA Asbestos Analysts Registry (AAR) Program.

Air samples submitted for Transmission Electron Microscopy (TEM), for which quantification of asbestos is desired, shall be prepared and analyzed according to the standard Asbestos Hazard Emergency Response Act (AHERA) method (AHERA; 40 CFR Part 763, Subpart E, Appendix A). All TEM analysis shall be performed by a NVLAP accredited laboratory. If a presence/absence analysis is desired, the analysis shall be performed using the AHERA method modified in the following manner:

- A minimum of two preparations shall be prepared and utilized for each sample
- Analysis shall be conducted on a minimum of four grid openings or until three or more structures are identified, whichever comes first
- Any structure (adhering to the AHERA counting rules) identified during analysis shall be reported
 - Identification of less than three structures shall be reported as present
 - Identification of three or greater structures shall be reported as detected

Any air sample analysis that results in a “cannot be read (CBR)” determination from the analyst, or a “not analyzed (NA) or rejected” due to loose debris or uneven loading, shall be evaluated by the AMS to determine if a cause of the CBR or NA can be ascertained. If it is determined that the CBR is a result of overloading from airborne emissions, then the AMS shall request that the laboratory prepare the sample, using an indirect preparation method, for TEM presence/absence analysis.

Deviation from this sampling and analysis appendix shall only be allowed upon consultation with, review by, and approval from, the Department.